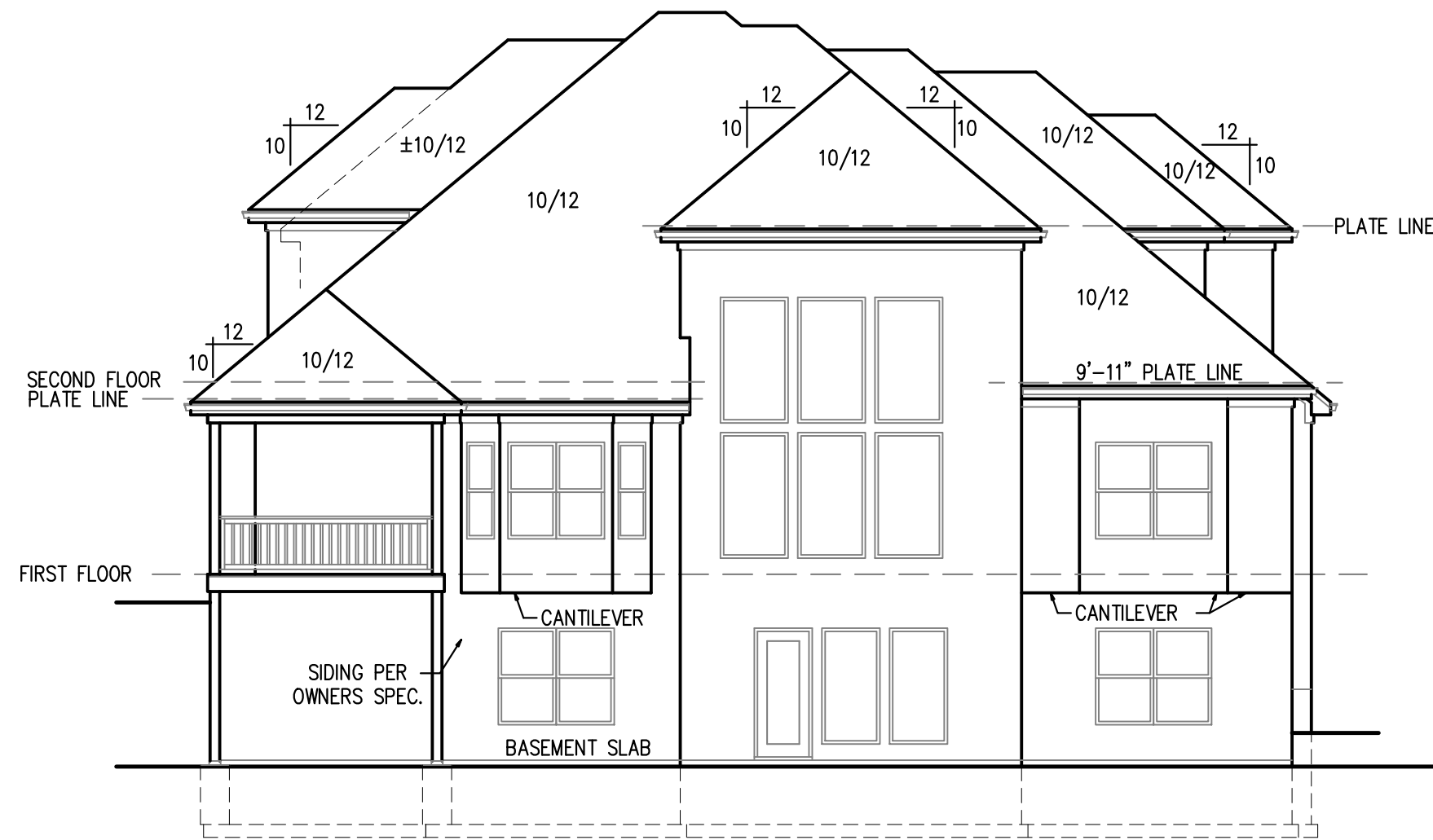
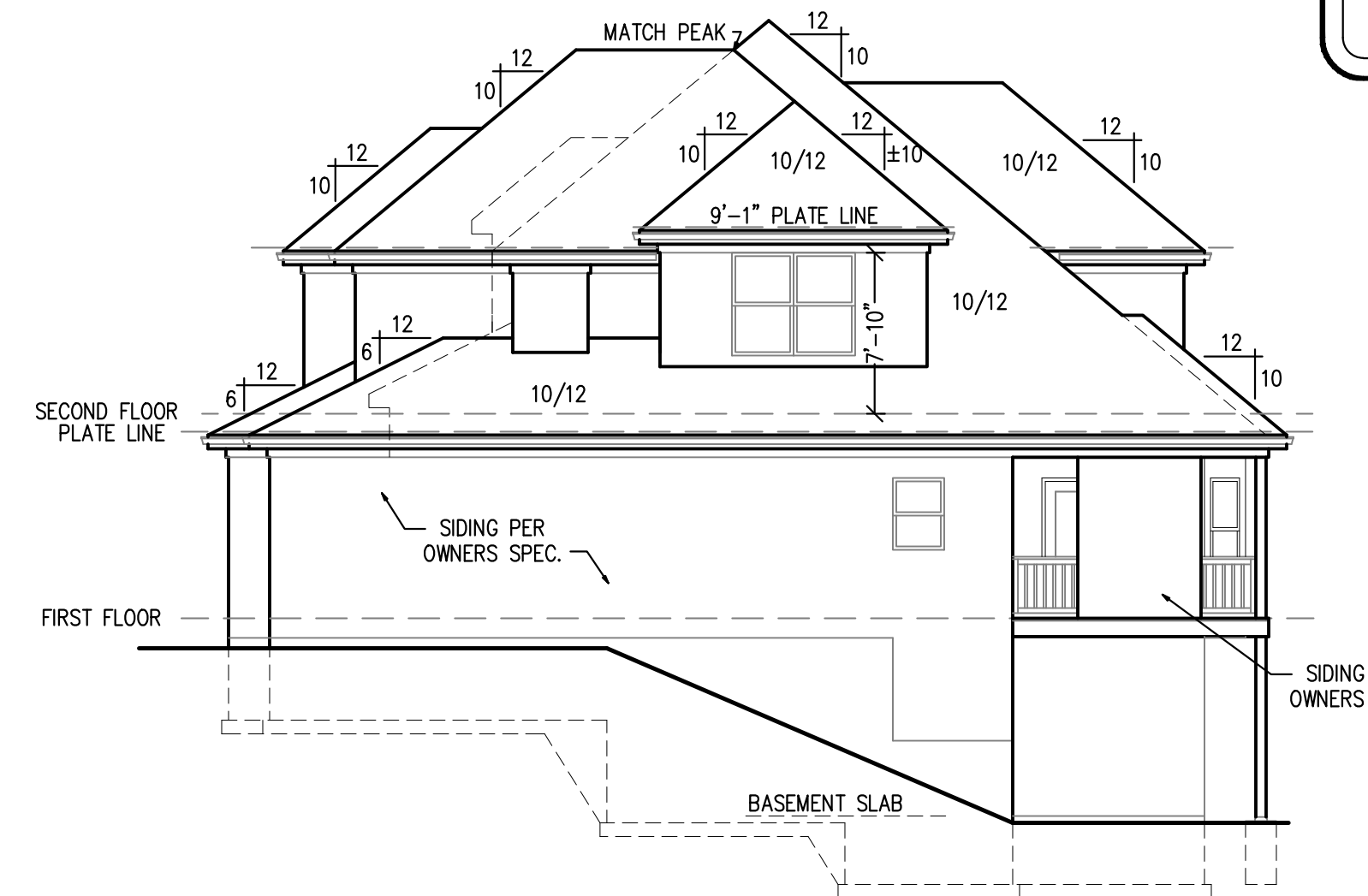


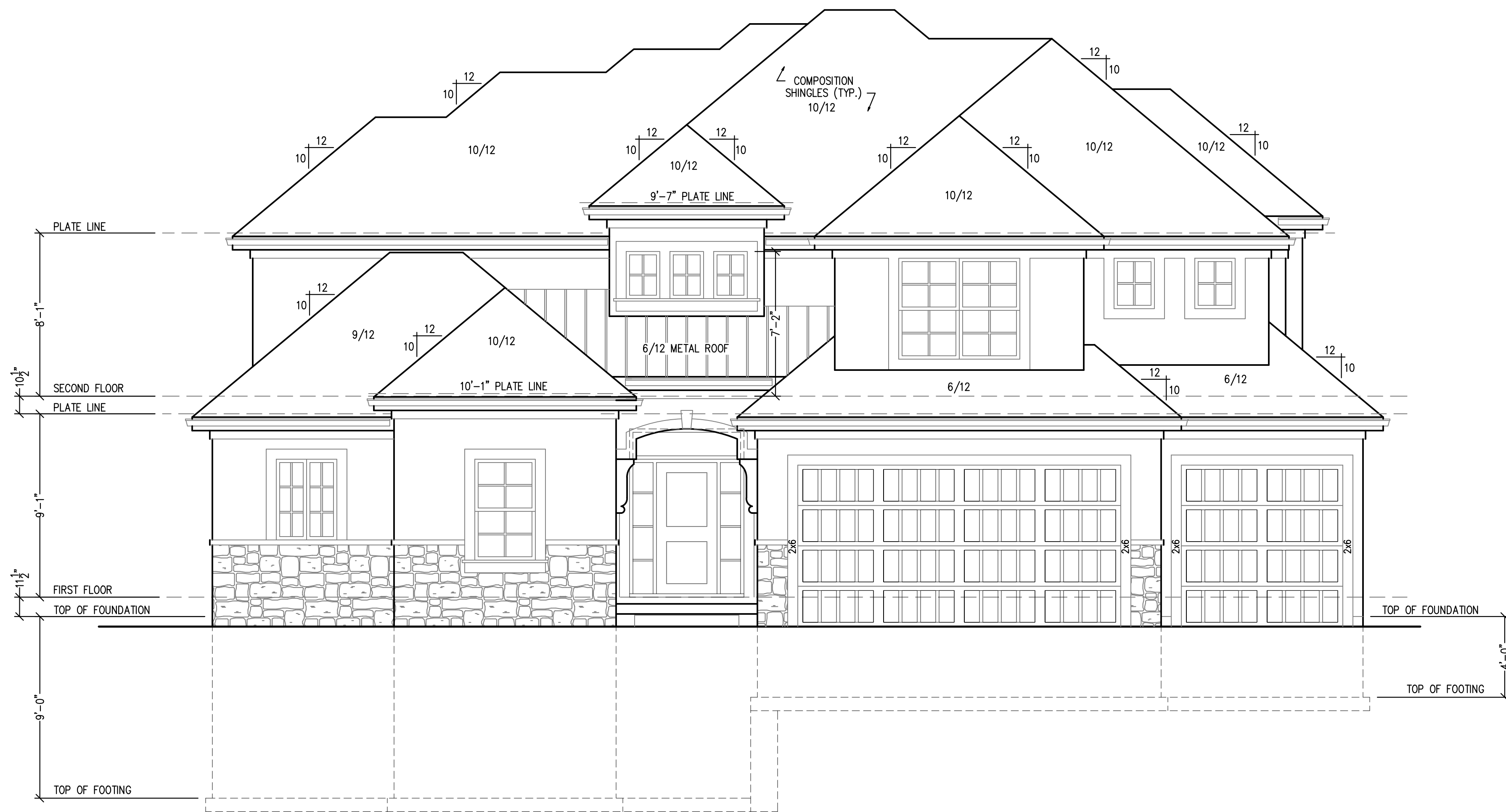
LEFT ELEVATION  
SCALE: 1/8" = 1'-0"



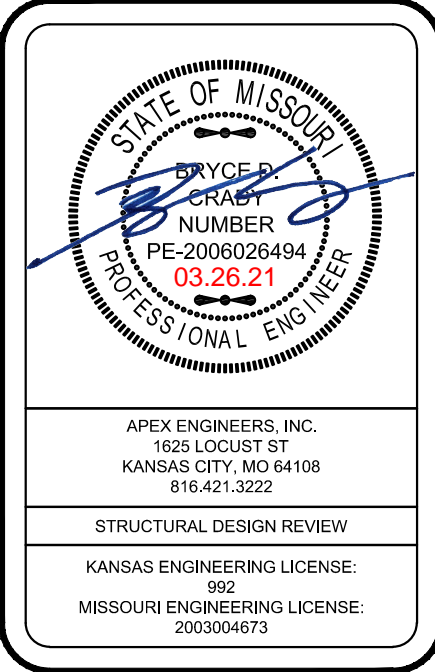
REAR ELEVATION  
SCALE: 1/8" = 1'-0"



RIGHT ELEVATION  
SCALE: 1/8" = 1'-0"



FRONT ELEVATION  
SCALE: 1/4" = 1'-0"



APEX ENGINEERS, INC.  
1625 LOCUST ST.  
KANSAS CITY, MO 64108  
816-431-3222

STRUCTURAL DESIGN REVIEW

KANSAS ENGINEERING LICENSE: 062  
MISSOURI ENGINEERING LICENSE: 200304673

New Mark Homes  
P.O. Box 12025  
Parkville, Missouri 64152  
Ph. (816) 969-9010

Residential Builder Resource, LLC  
Custom Home Drafting & Design Service  
Kansas City Metro  
Rural Missouri & Eastern Kansas  
Ph. (816) 472-5072

The Brooklyn  
Lot 3 Whispering Woods  
1920 SW River Run Dr.  
Lee's Summit, MO 64082  
© Copyright 2020

DRAWN BY: RBR

CHECKED BY: CA

DATE: 10-29-20

A1

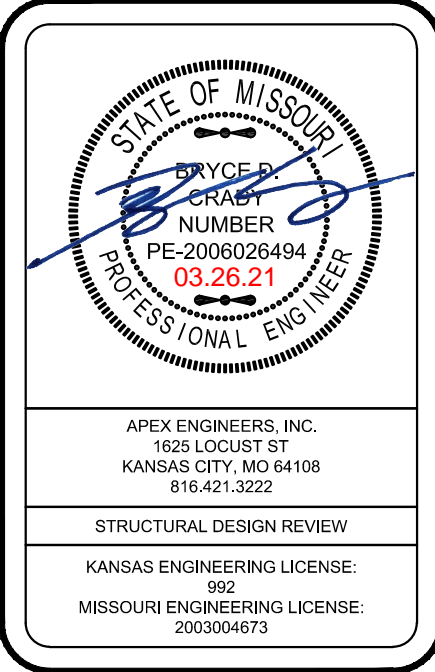
PROJ. #20-090

RELEASE FOR  
CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
DEVELOPMENT SERVICES  
LEE'S SUMMIT, MISSOURI  
03/30/2021

DISCLAIMER  
ACTUAL PLANS AND ELEVATIONS MAY VARY  
FROM ARCHITECTURAL DRAWINGS.  
DUE TO TERRAIN/BACKFILL PROCESS.  
FRONT ELEVATIONS ARE ARCHITECTURAL  
DRAWINGS AND MAY VARY DUE TO  
MATERIAL AVAILABILITY.

NOTE:  
PLANS DESIGNED PER IRC AS  
ADOPTED BY GOVERNING JURISDICTION





New Mark Homes  
P.O. Box 12025  
Parkville, Missouri 64152  
Ph. (816) 969-9010

Residential Builder Resource, LLC  
Custom Home Drafting & Design Service  
Kansas City Metro  
Rural Missouri & Eastern Kansas  
Ph. (816) 472-5072

The Brooklyn  
Lot 3 Whispering Woods  
1920 SW River Run Dr.  
Lee's Summit, MO 64082  
© Copyright 2020

DRAWN BY: RBR  
CHECKED BY: CA  
DATE: 10-29-20

PLEASE FOR  
CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
DEVELOPMENT SERVICES  
LEE'S SUMMIT, MISSOURI  
PROJ. #2020-090

BRACED WALL METHODOLOGY  
CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)  
UNLESS OTHERWISE NOTED ON THE PLAN

XXXX EXTERIOR BRACED WALLS:

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN  $\frac{3}{8}$ " WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN  $\frac{1}{4}$ " WITH MINIMUM SPAN RATING OF  $\frac{3}{4}$ " FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAX, UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

/// INTERIOR BRACED WALLS (REF 2-S4.0):

GB METHOD:  $\frac{1}{2}$ " MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH No 6 -  $1\frac{1}{4}$ " TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD ( MIN. 4'-0" SECTION FOR BOTH SIDES.)

OR

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

STRUCTURAL NOTES:

- ALL UNMARKED HEADERS MIN (2)#2-2x10
- ALL HEADERS AND BEAMS MIN #2 GRADE DF/L (OR EQ.)
- XXXXXXXXXX = BEARING WALL

COLUMN & PIER PAD SCHEDULE (REF. 5/S2.0)				
COLUMN MARK	PAD SIZE	REINFORCEMENT	COLUMN SIZE	COLUMN TYPE
A	30" x 30" x 12"	(4) #4 BAR E.W.	3" NOMINAL, UNO.	SCHEDULE 40 STEEL PIPE ( $f_y = 36$ ksi MIN.)
B	36" x 36" x 12"	(4) #4 BAR E.W.	3" NOMINAL, UNO.	
C	42" x 42" x 12"	(5) #4 BAR E.W.	3" NOMINAL, UNO.	
D	48" x 48" x 12"	(6) #4 BAR E.W.	3" NOMINAL, UNO.	
E	54" x 54" x 16"	(8) #4 BAR E.W.	3½" NOMINAL, UNO.	
F	60" x 60" x 16"	(10) #4 BAR E.W.	3½" NOMINAL, UNO.	

1. COLUMN & PAD SIZES SHOWN ARE FOR MAXIMUM COLUMN HEIGHT OF 10'-0", REQUIRES SEPARATE ENGR'D DESIGN IF GREATER THAN 10'-0" TALL.
2. COLUMN & PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 1,500 PSF.

COLUMN & PIER SCHEDULE		
MARK	COLUMN SIZE	PIER DIA.
G	6x6	12"
H	6x6	16"
I	6x6	18"
J	6x6	24"
K	6x6	28"

1. ALL PIERS TO BEAR ON ORIGINAL, UNDISTURBED SOIL OF 1,500 PSF BEARING CAPACITY OR FILL COMPACTED AND TESTED TO CONFORM TO THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
2. PIERS SHALL EXTEND BELOW THE FROST LINE: MIN. DEPTH OF 36" BELOW GRADE.
3. POST SHALL BE TREATED OR CEDAR WITH SIMPSON ABU66 POST BASE

DETAIL REFERENCES

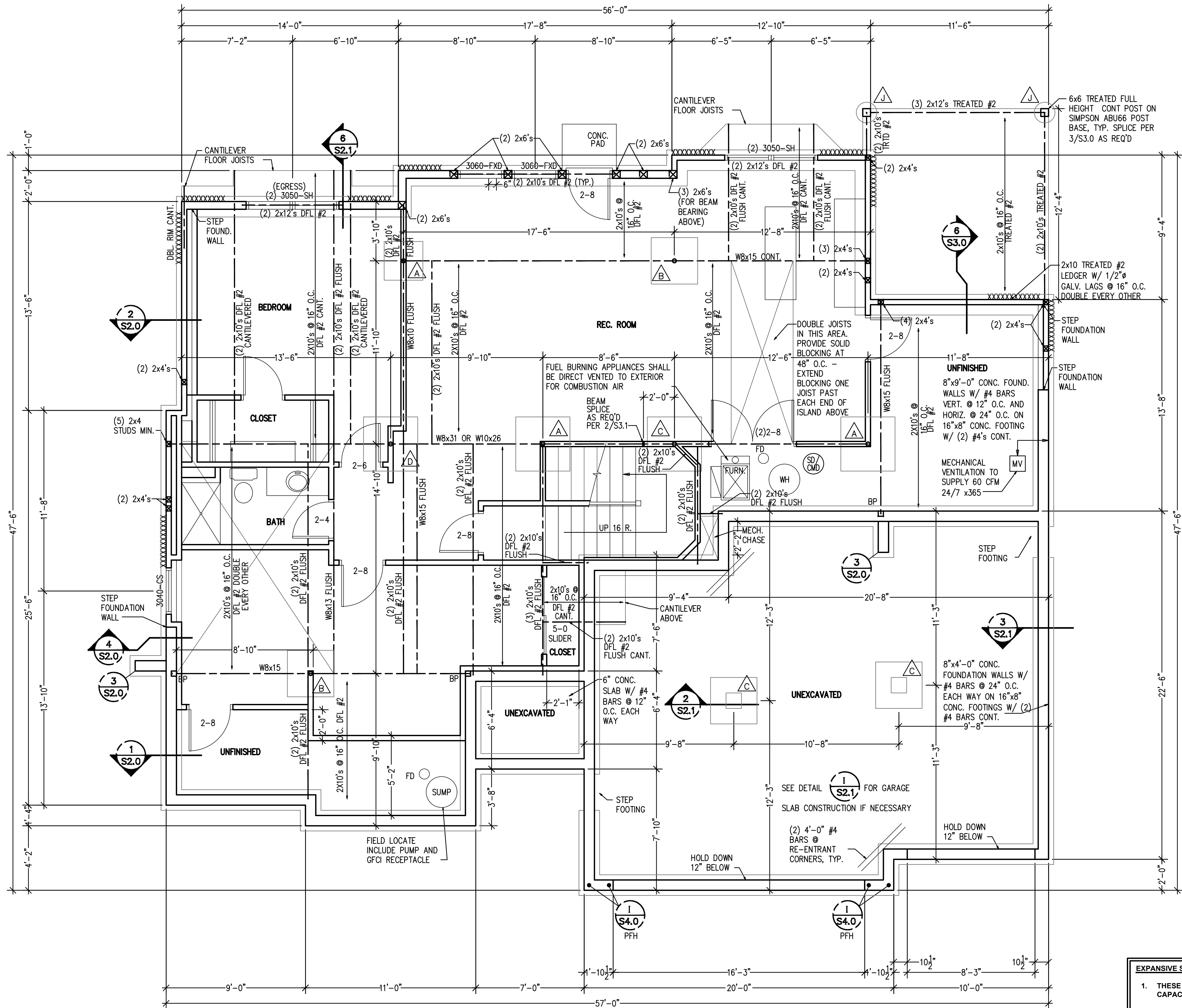
- |        |  |        |   |
|--------|--|--------|---|
| 1 S2.0 | TYPICAL FOUNDATION WALL DETAIL                 | 2 S2.1 | STRUCTURAL GARAGE SLAB PIER PAD DETAIL            |
| 2 S2.0 | TYPICAL "UNRESTRAINED" FOUNDATION WALL SECTION | 3 S2.1 | STRUCTURAL GARAGE SLAB / WALL SECTION             |
| 3 S2.0 | TYPICAL DEAD MAN DETAIL                        | 6 S2.1 | TYPICAL OVERDIG DETAIL AT BASEMENT SLAB           |
| 4 S2.0 | FOUNDATION WALL JUMP DETAIL                    | 1 S4.0 | ALTERNATE BRACED WALL PANEL DETAIL                |
| 5 S2.0 | COLUMN PAD DETAIL                              | 1 S4.0 | APA NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS |
| 1 S2.1 | TYPICAL STRUCTURAL GARAGE SLAB PLAN            | 1 S2.1 | COLUMN AND PIER PAD SCHEDULE (SHEET S2.0)         |

EXPANSIVE SOILS DISCLAIMER:

1. THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING JURISDICTION.
2. APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS BE EVALUATED BY A LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOUNDATION ELEMENTS. GEOTECHNICAL INVESTIGATION AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX.
3. APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING BELOW THE BASEMENT SLAB). BY USE OF THESE PLANS WITHOUT AN ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT, APEX SHALL NOT BE HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING, DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.

ALL WINDOWS SIZES ARE EXPRESSED IN FEET AND INCHES TO THE UNIT SIZE.

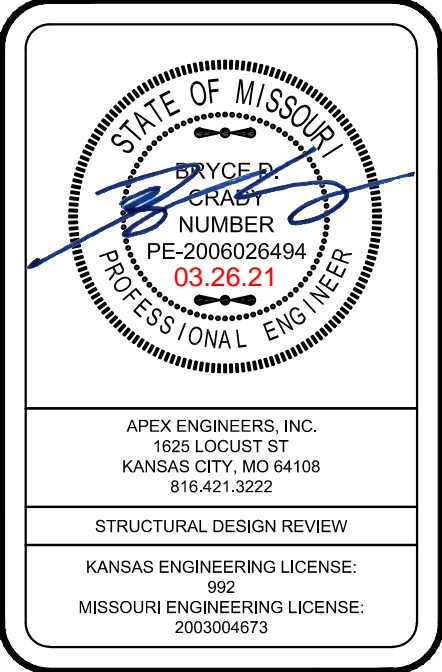
NOTE:  
PLANS DESIGNED PER IRC AS  
ADOPTED BY GOVERNING JURISDICTION



LOWER LEVEL PLAN

SCALE: 1/4" = 1'-0"

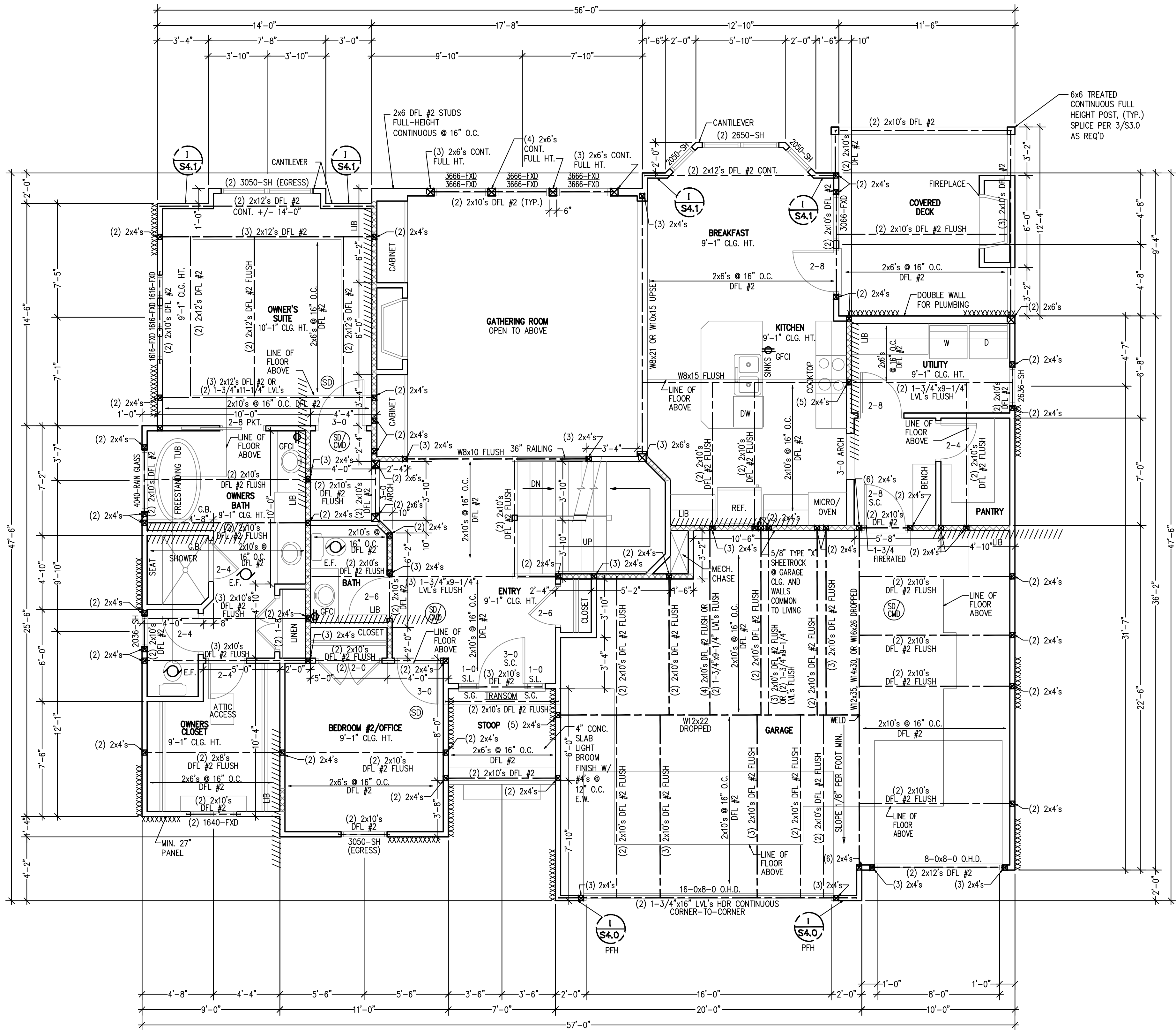




New Mark Homes  
P.O. Box 12025  
Parkville, Missouri 64152  
Ph. (816) 969-9010

Residential Builder Resource, LLC  
Custom Home Drafting & Design Service  
Kansas City Metro  
Rural Missouri & Eastern Kansas  
Ph. (816) 472-5072

The Brooklyn  
Lot 3 Whispering Woods  
1920 SW River Run Dr.  
Lee's Summit, MO 64082  
(C) Copyright 2020



FIRST FLOOR PLAN  
SCALE: 1/4" = 1'-0"

BRACED WALL METHODOLOGY  
CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)  
UNLESS OTHERWISE NOTED ON THE PLAN

XXXX EXTERIOR BRACED WALLS:

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN 3/8" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 24/0 FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAX UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

/// INTERIOR BRACED WALLS (REF. 2-S4.0):

GB METHOD: 1/2" MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH No 6 - 1 1/4" TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES).

OR

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

STRUCTURAL NOTES:

- ALL UNMARKED HEADERS MIN (2) 2x10
- ALL HEADERS AND BEAMS MIN #2 GRADE DFL (OR EQ.)
- XXXXXXXX = BEARING WALL

FIRST FLOOR -	1,678 SQ. FT.
SECOND FLOOR -	1,097 SQ. FT.
LOWER LEVEL -	1,182 SQ. FT.
TOTAL	3,957 SQ. FT.

GARAGE	671 SQ. FT.
UNFINISHED BASEMENT	296 SQ. FT.
DECK	143 SQ. FT.

\*ALL WINDOWS TO HAVE U = 0.35 OR LESS.

ALL WINDOWS SIZES ARE EXPRESSED  
IN FEET AND INCHES TO THE UNIT  
SIZE.

NOTE:  
PLANS DESIGNED PER IRC AS  
ADOPTED BY GOVERNING JURISDICTION

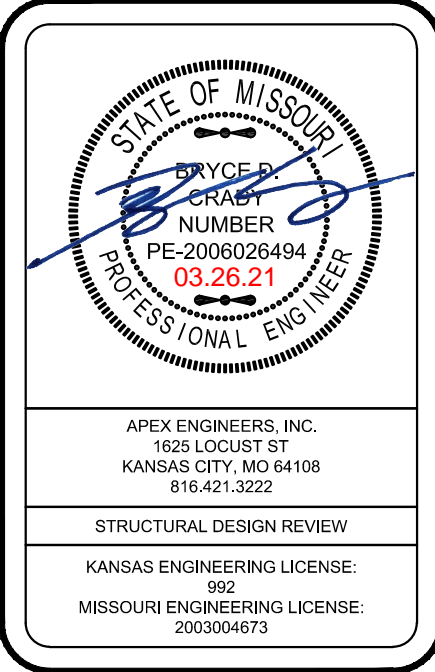
DRAWN BY: RBR

CHECKED BY: CA

DATE: 10-29-20

PLEASE FOR  
CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
DEVELOPMENT SERVICES  
LEE'S SUMMIT, MISSOURI  
PROJ. 2020-01-090





New Mark Homes  
P.O. Box 12025  
Parkville, Missouri 64152  
Ph. (816) 969-9010

Residential Builder Resource, LLC  
Custom Home Drafting & Design Service  
Kansas City Metro  
Rural Missouri & Eastern Kansas  
Ph. (816) 472-5072

The Brooklyn  
Lot 3 Whispering Woods  
1920 SW River Run Dr.  
Lee's Summit, MO 64082  
(C) Copyright 2020

DRAWN BY: RBR  
CHECKED BY: CA  
DATE: 10-29-20

PROJ. 090  
DATE: 07/20/21

BRACED WALL METHODOLOGY  
CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)  
UNLESS OTHERWISE NOTED ON THE PLAN

XXXX EXTERIOR BRACED WALLS:

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN  $\frac{3}{8}$ " WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN  $\frac{7}{16}$ " WITH MINIMUM SPAN RATING OF  $\frac{3}{4}$ " FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAXIMUM, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

/// INTERIOR BRACED WALLS (REF. 2-S4.0):

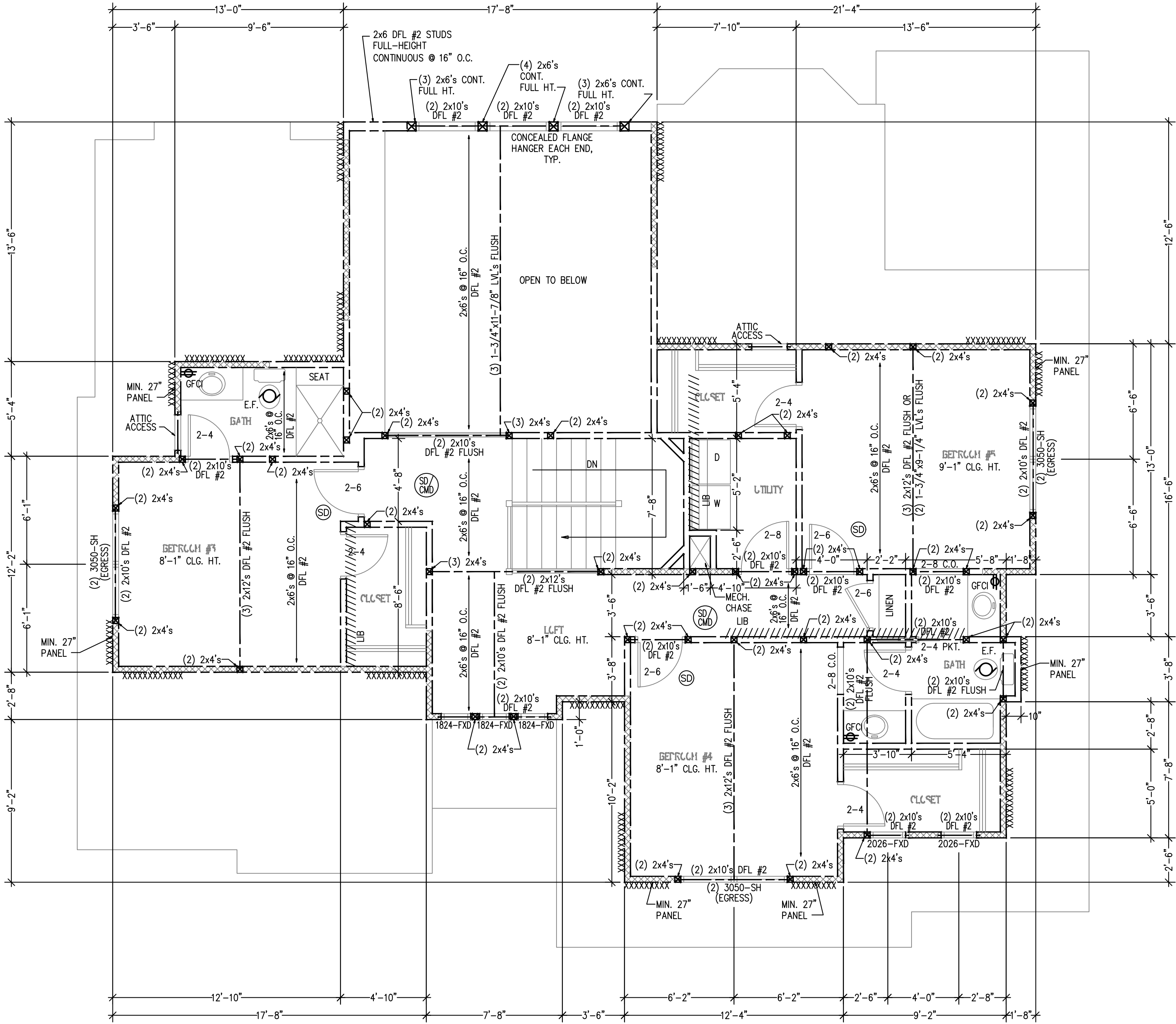
GB METHOD:  $\frac{1}{2}$ " MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH No 6 -  $\frac{1}{4}$ " TYPE "W" OR "S" DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES.)

OR

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

STRUCTURAL NOTES:

-ALL UNMARKED HEADERS MIN (2) #2-2x10  
-ALL HEADERS AND BEAMS MIN #2 GRADE DFL/L (OR EQ.)  
-XXXXXX = BEARING WALL



## SECOND FLOOR PLAN

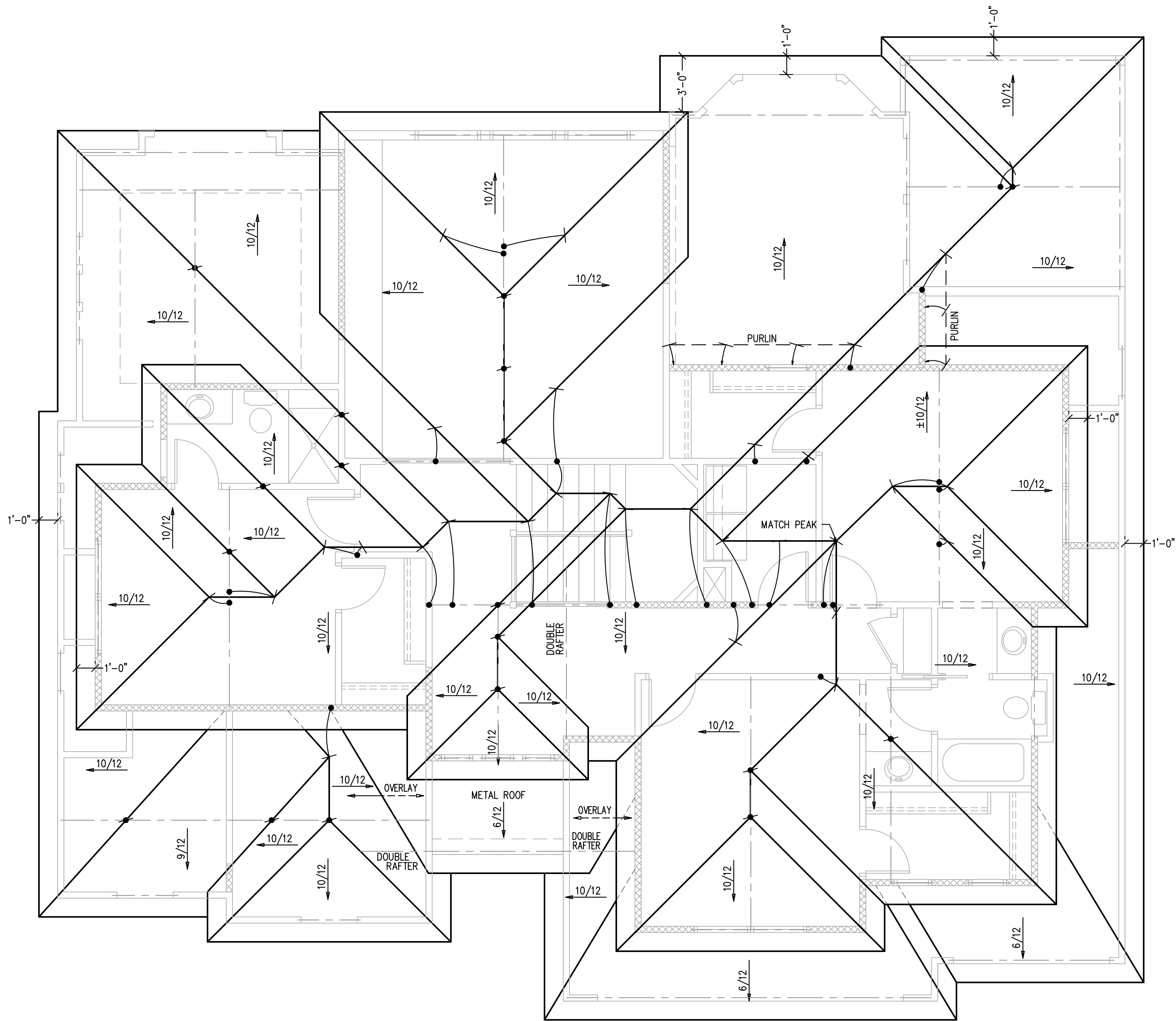
SCALE: 1/4" = 1'-0"

\*ALL WINDOWS TO HAVE U = 0.35 OR LESS.

ALL WINDOWS SIZES ARE EXPRESSED  
IN FEET AND INCHES TO THE UNIT  
SIZE.

NOTE:  
PLANS DESIGNED PER IRC AS  
ADOPTED BY GOVERNING JURISDICTION

PROJ. 090  
DATE: 07/20/21



ROOF PLAN  
SCALE: 1/4" = 1'-0"

ROOF FRAMING NOTES

ROOF DESIGNED FOR LIGHT ROOF COVERING  
30psf TOTAL LOAD [10psf DL, 20psf LL (SL)]

ROOF SYSTEM IS DESIGNED TO MEET REQUIREMENTS OF IRC  
802

\*RAFTERS (HEM-FIR, DOUG-FIR, OR EQUAL):  
SEE SPAN CHARTS BELOW

CODE MINIMUM

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	11'-7"
#2-2x6	AT 16" OC	14'-2"
#2-2x8	AT 24" OC	14'-8"
#2-2x8	AT 16" OC	17'-11"
#2-2x10	AT 24" OC	17'-10"
#2-2x10	AT 16" OC	21'-11"

NOTE: CODE MINIMUM ALLOWS FOR A RAFTER DEFLECTION OF L/180 TOTAL LOAD

HIGHER PERFORMANCE

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	8'-6"
#2-2x6	AT 16" OC	9'-9"
#2-2x8	AT 24" OC	11'-3"
#2-2x8	AT 16" OC	12'-9"
#2-2x10	AT 24" OC	14'-3"
#2-2x10	AT 16" OC	16'-3"

APEX ENGINEERS, INC. RECOMMENDED DEFLECTION =  
L/360 LIVE LOAD, L/240 TOTAL LOAD

\*RIDGE BOARDS ARE (UNLESS OTHERWISE NOTED)

#2-2x10 UP TO 9:12 PITCH

#2-2x12 OVER 9:12 PITCH

\*ALL HIP AND VALLEYS ARE (UNLESS OTHERWISE NOTED)

#2-2x10 UP TO 9:12 PITCH

#2-2x12 OVER 9:12 PITCH

\*PURLINS ARE 2x6 MIN

-PURLIN STRUTS ARE AT 4'-0" OC

-PURLIN STRUTS SHALL BE INSTALLED AT NOT LESS THAN A

45 DEGREE ANGLE WITH THE HORIZONTAL

-ALL PURLIN STRUTS SHALL HAVE A MAX UNBRACED LENGTH

OF 8'-0"

-PURLIN STRUTS SHALL BE CONSTRUCTED IN A "T"

CONFIGURATION AND PER THE FOLLOWING CHART:

PURLIN STRUT	MAX PURLIN STRUT LENGTH
--------------	-------------------------

(2)2x4 8'-0"

(1)2x4 AND (1)2x6 12'-0"

(1)2x6 AND (1)2x8 20'-0"

(2)2x6 AND (1)2x8 30'-0"

CONSULT ARCH ENGR >30'-0"

\*EACH END OF STRUT SHALL BE FASTENED WITH MIN (3)8d OR

(2)16d NAILS

\*RIDGE BRACERS ARE SAME AS PURLIN BRACES-SPACING, SIZE,

CONFIGURATION, AND INSTALLATION (SEE PURLIN BRACE NOTES

ABOVE)

\*HIP AND VALLEY BRACES ARE THE SAME AS PURLINS SIZE,

CONFIGURATION, AND INSTALLATION (SEE PURLIN BRACE NOTES

ABOVE)

= ROOF BRACE/STRUT (PER CHART)

-SLASH IS TOP END OF BRACE

-CIRCLE IS BOTTOM END OF BRACE

= PURLIN STRUTS AT 48" OC (PER CHART) U.N.O.

-SLASH IS TOP END OF BRACE

-ARROW IS BEARING LOCATION

----- DENOTES BEARING WALL

----- DENOTES PURLIN

----- DENOTES BEARING STRUCTURE

STRUCTURAL NOTES:

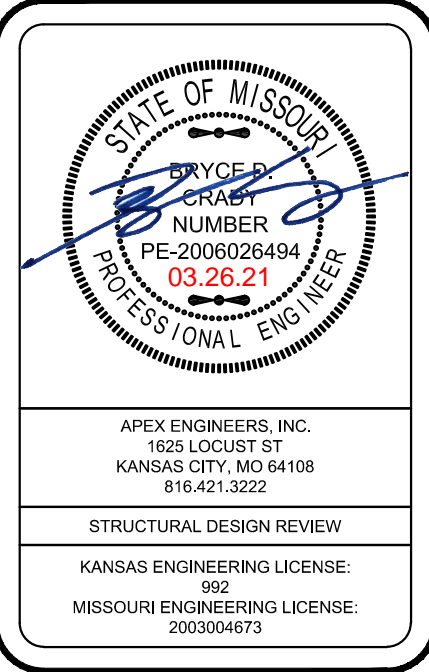
-ALL UNMARKED HEADERS MIN (2)#2-2x10

-ALL HEADERS AND BEAMS MIN #2 GRADE

DF/L (OR EQ.)

----- = BEARING WALL

1. THIS IS AN ENGINEERED ROOF STRUCTURE DESIGNED FOR COMPLIANCE WITH IRC 802.3, BUILD AS SHOWN WITH NO DEVIATIONS.
2. ALL HIP AND VALLEYS ARE DESIGNED TO BE CONTROLLED BY BENDING.
3. SHEAR AT BEARING WITH MIN 5 1/2" DEPTH DOES NOT CONTROL DESIGN. FOR VALLEYS REF 4/S3.2



New Mark Homes  
P.O. Box 12025  
Parkville, Missouri 64152  
Ph. (816) 969-9010

Residential Builder Resource, LLC  
Custom Home Drafting & Design Service  
Kansas City Metro  
Rural Missouri & Eastern Kansas  
Ph. (816) 472-5072

The Brooklyn  
Lot 3 Whispering Woods  
1920 SW River Run Dr.  
Lee's Summit, MO 64082  
© Copyright 2020

DRAWN BY: RBR

CHECKED BY: CA

DATE: 10-29-20

PLEASE FOR CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
DEVELOPMENT SERVICES  
LEE'S SUMMIT, MISSOURI  
PROJ. 090

NOTE:  
PLANS DESIGNED PER IRC AS  
ADOPTED BY GOVERNING JURISDICTION



BUILDING COMPONENT	MATERIAL	FASTENING
ROOF SHEATHING <sup>1</sup>	7/16" PLYWOOD 1x4 #3 FURRING	16 GA X 1-3/4" STAPLES AT 3" OC EDGES AND 6" OC IN FIELD 1/2" CROWN STAPLES
FLOOR SHEATHING <sup>1</sup>	3/4" T&G YELLOW PINE PLYWOOD APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED	8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN THE FIELD 14 GA X 2" STAPLES AT 4" OC EDGES AND 8" OC IN THE FIELD 12.5 GA X 1-1/2" RING OR SCREW SHANK NAILS AT 6" OC EDGES AND 8" OC IN THE FIELD
CEILING COVERING <sup>1</sup>	1/2" GYPSUM SHEATHING	7" OC NAILED / 12" OC SCREWED WITH 13 GA, 1-3/8" LONG, 19/64" HEAD; 0.098 DIA, 1-1/4" LONG, ANGLE-RINGED; 5d COOLER NAIL, 0.086 DIA, 1-5/8" LONG, 19/64" HEAD; OR GYP BD NAIL, 0.086 DIA, 1-5/8" LONG, 9/32" HEAD
INTERIOR WALL COVERING <sup>1</sup>	1/2" GYPSUM SHEATHING	6d COMMON NAILS: 1-5/8" GALVANIZED STAPLES; 1-1/4" SCREWS, TYPE W OR S; AT 4" OC EDGES AND 8" OC IN THE FIELD
EXTERIOR WALL SHEATHING	MIN 3/8" APA RATED SHEATHING	8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN THE FIELD
CONVENTIONAL WOOD FRAMED WALLS	*SUPPORTING 2 FLOORS, ROOF, AND CEILING OR LESS. *HEIGHT: 10'-0" OR LESS *SIZE: NOM 2x4 (NOM 2x6 WHEN SUPPORTING 2 FLOORS, CEILING, AND ROOF) *SPECIES: DOUG-FIR, HEM-FIR, SOUTH PINE, SPRUCE-PINE-FIR *MAXIMUM SPACING 16" OC *STUDS 10' LENGTH OR LESS SHALL BE #3 STANDARD, OR STUD GRADE *STUDS OVER 10' LENGTH SHALL BE MIN #2 GRADE	*TOE NAIL RIM JOIST TO SILL OR PLATE. *TOE NAIL STUD TO TOP AND SOLE PLATE. *END NAIL TOP AND SOLE PLATE TO STUD. *FACE NAIL BUILT-UP CORNER STUDS AT BRACED WALL PANELS. *FACE NAIL BUILT-UP CORNER STUDS AT BRACED WALL PANELS. *FACE NAIL JACK STUDS/TRIMMERS SUPPORTING HEADERS WITH: FACE NAIL DBL TOP PLATE. *DBL TOP PLATES WITH MIN 48" OFFSET OF EACH FACE NAIL LAPPED AREA WITH FACE NAIL DBL TOP PLATE AT LAPPED CORNERS AND INTERSECTIONS WITH: FACE NAIL SOLE PLATE TO FRAMING SYSTEM WITH: *TOENAIL BRIDGING TO JOIST: EACH END: FACE NAIL LEDGER STRIPS SUPPORTING JOISTS OR RAFTERS WITH:
CONVENTIONAL WOOD HEADER FRAMING	PER PLAN	8d COMMON AT 6" OC; 3"x6; 13"x1" AT 6" OC; 3"x6; 13"x1" AT 8" OC; (1) 8d COMMON; (4) 3"x6; 13"x1" / 2) 16d COMMON; (3) 3"x6; 13"x1" / 16d AT 24" OC; 3"x6; 13"x1" AT 16" 16d COMMON NAILS AT 16" OC; 3"x6; 13"x1" AT 12" OC 16d NAILS AT 6" OC 16d COMMON AT 16" OC; 3"x6; 13"x1" AT 12" OC; 3"x6; 12" AT 12" OC (8) 16d COMMON; (12) 3"x6; 13"x1"; (12) 3"x6; 12d" (2) 16d COMMON; (3) 3"x6; 13"x1"; (3) 3"x6; 12d" 16d COMMON AT 16" OC; 3"x6; 13"x1" AT 12" OC (2) 8d COMMON; (2) 3"x6; 13"x1"; (3) 3"x6; 12d" (3) 16d COMMON; (4) 3"x6; 13"x1"; (4) 3"x6; 12d"
RAFTER TIES <sup>2</sup>	MIN 2x4 MEMBERS AT EACH RAFTER	REF TABLE R802.5.2
COLLAR TIES	MIN 1x4 MEMBERS AT 48" OC	FACENAIL TO RAFTERS IN UPPER 1/3 OF ATTIC SPACE WITH 16d NAILS AT EACH
1. NOTE: ALL SHEATHING MATERIALS TO BE APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED. 2. RAFTER TIES SHALL NOT BE REQUIRED WHEN A STRUCTURAL RIDGE HAS BEEN PROVIDED AND ADEQUATELY DESIGNED (AS IN A FULLY VAULTED ROOM). SUCH SHALL BE NOTED AS "STRUCTURAL" ON THE PLAN.		
BUILDING COMPONENT	FASTEN TO	FASTEN WITH
RAFTERS	TO RIDGE/VALLEY/HIP RAFTERS	TOENAIL WITH (3) 16d ENDNAIL WITH (2) 16d
	TO PLATE	TOENAIL WITH (2) 16d
CEILING JOISTS	TO TOP PLATE WHERE CEILING JOISTS RUN PARALLEL TO RAFTERS FACENAIL TO RAFTERS WITH (3) 16d MIN.	TOENAIL WITH (3) 8d AT EACH END
FLOOR JOISTS	TO SILL OR GIRDER TO RIM JOIST	TOENAIL WITH: (3) 8d COMMON; (3) 3"x6; 13"x1"; (4) 3"x6; 12d" ENDNAIL WITH: (3) 16d COMMON; (4) 3"x6; 13"x1"; (4) 3"x6; 12d"
BRACED WALL PANELS PERP TO FRAMING MEMBERS ABOVE/BELOW: PARALLEL TO FRAMING MEMBERS ABOVE/BELOW:	TO FRAMING MEMBER TO FRAMING AND BLOCKING AT 16" OC	SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x6; 13"x1" TOP PL, 6" OC WITH: 8d COMMON; 3"x6; 13"x1" SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x6; 13"x1" AND AT EACH BLOCK: (3) 16d COMMON; (4) 3"x6; 13"x1" TOP PL, 6" OC WITH: 8d COMMON; 3"x6; 13"x1" AND AT EACH BLOCK: (3) 8d COMMON; 3"x6; 13"x1"
NOTE: MEMBER THICKNESS AND FASTENING LISTED IN THIS SCHEDULE ARE MINIMUM IRC REQUIREMENTS. SPECIFIC PROJECT REQUIREMENTS NOTED WITHIN THE STRUCTURAL OR ARCHITECTURAL DRAWINGS, IF REQUIRED BY APEX ENGINEERS DESIGN NEEDING TO BE MORE STRINGENT, SHALL BE FOLLOWED.		

1. LIGHTING FIXTURES PENETRATING THE THERMAL ENVELOPE SHALL BE IC-RATED, LEAKAGE RATED, AND SEALED TO THE GYPSUM WALLBOARD AS REQUIRED PER N1103.4.5
2. PROGRAMMABLE THERMOSTATS SHALL BE INSTALLED AS REQUIRED PER N1103.4.1
3. AIR HANDLERS SHALL BE RATED FOR MAXIMUM 2% AIR LEAKAGE RATE PER N1103.3.2.1
4. BUILDING FRAMING CAVITIES SHALL NOT BE USED AS DUCTS OR PLENUMS PER N1103.3.5
5. HOT WATER PIPES SHALL BE INSULATED AS REQUIRED PER N1103.4
6. ALL EXHAUST FANS SHALL TERMINATE TO THE BUILDING EXTERIOR AS REQUIRED PER N1501.1
7. MAKEUP AIR SYSTEMS SHALL BE INSTALLED FOR KITCHEN EXHAUST HOODS THAT EXCEED 400 CFM AS REQUIRED PER M1503.6
8. AN AIR HANDLING SYSTEM SHALL NOT SERVE BOTH THE LIVING SPACE AND THE GARAGE PER M1601.6

THE ENERGY EFFICIENCY OF THE DWELLING SHALL COMPLY WITH THE FOLLOWING TABLE(S) (WHERE THERE ARE DISCREPANCIES BETWEEN THIS TABLE AND THE PLANS, THE MOST RESTRICTIVE SHALL APPLY). IF TABLE 1 IS NOT COMPLETED AND ACCOMPANIED BY RESCHECK CALCULATIONS, THEN TABLE 2 SHALL BE APPLIED.

<b>BUILDING ELEMENT</b>	<b>MIN VALUE</b>
WALLS - FRAMED	R-
WALLS - BASEMENT	R-
FLOORS - UNCONDITIONED SPACE	R-
FLOORS - OVER OUTSIDE AIR	R-
FLOORS - CRAWL SPACE	R-
SLAB - PERIMETER	R-
CEILING - FLAT	R-
CEILING - CATHEDRAL	R-
DOORS - GLASS	U-
DOORS - SOLID	U-
WINDOWS - OPERABLE	U-
WINDOWS - FIXED	U-
WINDOWS - OTHER	U-
FURNACE	AFUE-
AIR CONDITIONER	SEER-

**NOTE: FOR USE OF TABLE 1 A ResCheck COMPLIANCE FORM MUST BE**

BUILDING ELEMENT		MIN VALUE
CEILING - FLAT		R-49
CEILING - CATHEDRAL**		R-30
CEILING - CATHEDRAL		R-38
FLOORS - UNCONDITIONED SPACED		R-19
FLOORS - OVER OUTSIDE AIR		R-30
WALLS - BASEMENT	R-10 (CONT) OR R-13 (CAVITY)	
CONCRETE SLAB ON GRADE	R-10 (FOR 2FT)	
SKYLIGHTS	U=0.55	
WALLS - EXTERIOR (2x4)	R-13 (CAVITY) + R-5 (CONT)	
WALLS - EXTERIOR (2x6)	R-20	
WALLS - CRAWL SPACE	R-19	
GLAZING*	U<=0.32	
GLAZING*	SHGF<=0.40	

NOTE:  
TABLE 2 PER IRC TABLE N1102.1.2  
\*DEFAULT U-FACTOR FOR DOUBLE PANE, ARGON FILLED LOW-E  
TREATMENT IS U=0.35  
\*\*LIMITED TO AREAS LESS THAN 500 SQ-FT OR 20% OF CEILING AREA.

1. THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE PLANS FOR REVIEW BY THE BUILDING OFFICIAL. DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN THE GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE BUILDING OFFICIAL HAS REVIEWED THE DOCUMENTS. DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. DEFERRED SUBMITTALS ARE DEFINED AS THOSE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF THE APPLICATION AND THAT ARE TO BE SUBMITTED TO THE BUILDING OFFICIAL WITH A SPECIFIED PERIOD. DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE THE PRIOR APPROVAL OF THE BUILDING OFFICIAL.
2. DEFERRED SUBMITTAL ITEMS (WHEN APPLICABLE):
  - A. TRUSSES
  - B. I-JOISTS
  - C. GUARDRAILS AND HANDRAILS
  - D. STEEL FABRICATED STAIRS
  - E. PRE-MANUFACTURED CANOPES AND AWNINGS
  - F. PRECAST HOLLOW CORE SLABS
  - G. GROUND IMPROVEMENT AND/OR STRUCTURAL FOUNDATION SOLUTIONS (SUCH AS DRILLED PIERS)

CONCRETE SHALL BE AIR ENTRAINED WITH A MINIMUM COMPRESSIVE STRENGTH OF 28 DAYS OF 2,500 PSI FOR BASEMENT AND INTERIOR FLOOR SLABS, 3,000 PSI FOR BASEMENT AND FOUNDATION WALLS, AND 3,500 FOR PORCHES, CARPORTS, AND GARAGE FLOOR SLABS.

GLAZING IN HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC SECTION R308.4 SHALL BE OF APPROVED SAFETY GLAZING MATERIALS: GLASS IN STORM DOORS; INDIVIDUAL FIXED OR OPENABLE PANELS ADJACENT TO A DOOR WHERE THE NEAREST VERTICAL EDGE IS WITHIN A 24" ARCH OF THE DOOR IN A CLOSED POSITION AND WHOSE BOTTOM EDGE IS WITHIN 60" OF THE FLOOR; WALLS ENCLOSING STAIRWAYS AND LANDINGS WHERE THE GLAZING IS WITHIN 60" OF THE TOP OR BOTTOM OF THE STAIR; ENCLOSURES FOR SPAS, TUBS, SHOWERS, AND WHIRLPOOLS; GLAZING IN FIXED OR OPENABLE PANELS EXCEEDING 9 SQUARE FEET AND WHOSE BOTTOM EDGE IS LESS THAN 18" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 36".

1. PROVIDE ONE WINDOW FROM EACH BEDROOM THAT HAS A MINIMUM OPENABLE AREA OF 5.7 SQUARE FEET WITH A MINIMUM OPENABLE HEIGHT OF 24 INCHES AND WIDTH OF 20 INCHES.
2. BASEMENT EGRESS TO MEET THE REQUIREMENTS OF IRC SECTION 310.
3. SMOKE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R314. SMOKE ALARMS SHALL BE INSTALLED IN EACH SLEEPING ROOM, OUTSIDE OF EACH SLEEPING AREA, ON EACH FLOOR INCLUDING BASEMENTS AND HABITABLE ATTICS, AND NOT LESS THAN 3'-0" HORIZONTALLY FROM DOOR OR OPENING OF A BATHROOM THAT CONTAINS A BATHTUB OR SHOWER. ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WILL ACTUATE ALL THE ALARMS IN THE DWELLING.
5. CARBON MONOXIDE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R315.
6. CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA, WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM OR AT ITS ATTACHMENT. A CARBON MONOXIDE ALARM SHALL BE INSTALLED WITHIN THE BEDROOM.

1. ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS NOTED OTHERWISE.
2. ALL HEADERS TO BE MIN (2) #2-x10 UNLESS NOTED OTHERWISE.
3. BLOCK CANTILEVERS, DOORJAMBS, AND OVER BEAMS.
4. ALL HEADERS TO BEAR ON A MINIMUM OF (2) 2x4 STUD POSTS UNLESS NOTED OTHERWISE.
5. ALL NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.
6. WHERE JOISTS RUN PARALLEL TO FOUNDATION WALLS, SOLID BLOCKING FOR A MINIMUM OF (2) JOIST SPACES BE PROVIDED TO A MAXIMUM OF 2'-0" CENTERS TO TRANSFER LATERAL LOADS ON THE WALL TO THE FLOOR DIAPHRAGM. THE BLOCKING SHALL BE SECURELY NAILLED TO THE JOISTS AND FLOORING. NAIL TO JOIST: 2x4s AT 12" ON CENTER (IRC SECTION R602.3.1(1)). IF DOUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S), NAIL 2x4s FLAT AT 2'-0" CENTERS WITHIN THE JOIST SPACE(S) AND THEN PROVIDE SOLID BLOCKING, INSTALLED UPRIGHT, IN THE NEXT TWO JOIST SPACES. SECURE THE 2x4s TO THE JOIST.
7. ALL SILL AND SLEEPERS SUPPORTED ON CONCRETE OR MASONRY AND FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY RESISTANT MATERIALS.

1. PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE WITH AMENDMENTS AS ADOPTED BY THE GOVERNING JURISDICTION, IF ANY CHANGES OR VARIATIONS ARE REQUIRED. THE USER OF THESE PLANS SHALL BE RESPONSIBLE FOR ANY SUCH CHANGES OR VARIATIONS. THE USER OF THESE PLANS SHALL NOTIFY THE APPROPRIATE AUTHORITY AND ENGINEER OF RECORD, EITHER (OR BOTH) OF WHOM MAY REQUIRE REVISED DRAWINGS OR CALCULATIONS AT ITS DISCRETION.

2. REPRODUCTION, ALTERATION, OR RE-USE BY ANY METHOD OF ALL OR PORTIONS OF THESE STRUCTURAL PLANS OR VARIATIONS THEREOF WITHOUT WRITTEN PERMISSION FROM APEX ENGINEERS, INC IS STRICTLY PROHIBITED. THE DRAWINGS AND DETAILS OF THIS SHEET SET, BEING INSTRUMENTS OF SERVICE, ARE THE PROPERTY OF APEX ENGINEERS, INC. ANY REPRODUCTION, ALTERATION, OR RE-USE OF ANY PART OF THESE PLANS, INCLUDING ANY UNPAID FOR VERSION, OR A VERSION VOID OF APEX ENGINEERS LOGO AND/OR TITLE BLOCK, SHALL BE CONSIDERED AN UNAUTHORIZED REPRODUCTION.

3. WHERE DISCREPANCIES EXIST BETWEEN THE STANDARD CONDITIONS, NOTES AND THE SPECIFICATIONS, THE SPECIFICATIONS SHALL CONTROL. THESE PLANS APPLY, THE DRAWINGS SHALL COMPLY WITH THE FOLLOWING LOAD CONDITIONS:

AREA	MIN DEAD LOAD	MIN LIVE LOAD
EXTERIOR BALCONIES	10 PSF	60 PSF
DECKS	10 PSF	40 PSF
CEILING JOISTS/ATTICS NO STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE 3:12 OR LESS	5 PSF	10 PSF
CEILING JOISTS/ATTICS WITHOUT STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE OVER 3:12 OR LESS	10 PSF	10 PSF
CEILING JOISTS/ATTICS WITH STORAGE - DOOR/PULL DOWN LADDER ACCESS	10 PSF	20 PSF
ROOMS - NON-SLEEPING	10 PSF	40 PSF
ROOMS - SLEEPING	10 PSF	30 PSF
ROOF - LIGHT ROOF COVERING	10 PSF	20 PSF
ROOF - HEAVY ROOF COVERING CONCRETE/TILE/SLATE	20 PSF	20 PSF

NOTE: HEAVY ROOF COVERING WILL NOT BE INSTALLED OR USED IN THE DESIGN CALCULATIONS UNLESS IT IS SPECIFICALLY NOTED ON THE PLANS THAT THE DESIGN IS FOR HEAVY ROOF COVERINGS.

- THE FOUNDATION DESIGN SHALL BE BASED ON A MINIMUM SOIL BEARING CAPACITY OF 2000 PSF, UNLESS OTHERWISE INDICATED ON THE PLANS OR IF MODIFIED BY AN ENGINEERING REPORT BASED ON ACTUAL SITE CONDITIONS.
- CONCRETE SHALL MEET THE FOLLOWING SPECIFIED DESIGN STRENGTH CRITERIA:
  - 2500 PSI FOR BASEMENT FLOOR SLABS ON UNDISTURBED SOIL
  - 3000 PSI FOR FOOTINGS AND FOUNDATION WALLS
  - 3500 PSI FOR GARAGE FLOOR SLABS
3. FOOTINGS SHALL EXTEND BELOW THE FROST LINE; MINIMUM DEPTH 36 INCHES BELOW GRADE.
4. UNLESS OTHERWISE NOTED ON THE PLANS OR IF SITE CONDITIONS REQUIRE OTHERWISE, FOOTINGS SHALL BE WITHIN A MINIMUM OF 16" WIDE AND 8" DEEP WITH (2) #4 BARS CONTINUOUS.
5. COLUMN PADS SHALL BE A MINIMUM 30"x30"x12" WITH (4) #4 BARS EACH WAY UNLESS NOTED OTHERWISE.
6. UNLESS NOTED OTHERWISE ON THE PLANS, FOUNDATION WALLS SHALL BE MINIMUM 8" THICK, 8'-0" TALL AND REINFORCED PER DETAIL 1-5-2.0. FOUNDATION WALLS GREATER THAN 12'-0" TALL REQUIRE A SEPARATE ENGINEERED DESIGN. PROVIDE A 2'-0" LONG INTERIOR OR EXTERIOR DEAD-MAN FOR ANY STRAIGHT WALL PANELS EXCEEDING 20'-0" IN LENGTH (REF 3-S-2.0).
7. REINFORCEMENT SHALL BE MINIMUM GRADE 40 UNLESS NOTED OTHERWISE. REINFORCEMENT SHALL LAP A MINIMUM OF 24" AT ENDS, SPLICES, AND AROUND BARS.
8. FOUNDATION WALLS SHALL BE BACKFILLED WITH A CLEAN LEAN CLAY (OR BETTER) LOW VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER OF RECORD.
9. FOUNDATION WALLS WILL NOT ACHIEVE FULL STRENGTH UNTIL THE INTERIOR OF THE FOUNDATION WALLS IS BACKFILLED WITH GREATER THAN 8" OF EARTHEN FILL OR 24" OF GRANULAR FILL. A STRUCTURAL BASEMENT SLAB (TO BE DESIGNED OR DESIGN REVIEWED BY APEX ENGINEERS), OR ALTERNATE ENGINEERED SOLUTION (I.E. ENGINEERED FILL) WILL BE REQUIRED.
10. FOUNDATION WALLS SHALL BE REINFORCED WITH DETAIL 1-5-2.0. FOUNDATION WALLS AND FOOTINGS SHALL BE FORMED CONTINUOUS AND POURED PER DETAIL 4-S-2.0.
11. CONCRETE FLOOR SLABS SHALL BE A MINIMUM 4" THICK OVER A MINIMUM 4" BASE OF 1/2" OR 3/4" CLEAN GRADED ROCK, UNLESS NOTED OTHERWISE OR IF SITE CONDITIONS REQUIRE OTHERWISE.
12. CONCRETE FLOOR SLABS SHALL BE COVERED WITH A THICK POLYETHYLENE MOISTURE BARRIER OVER POURING GRAVEL BASE UNDER BASEMENT FLOOR SLAB PER R406.2. LAP JOINTS MINIMUM 6" (NOT REQUIRED FOR GARAGE SLABS OR DETACHED ACCESSORY BUILDINGS).
13. PROVIDE A STRUCTURAL REINFORCED CONCRETE FLOOR OVER A USABLE AREA, SUCH AS A GARAGE FLOOR LOCATED OVER A STORAGE AREA, SUBMIT SEALED ENGINEERED DETAILS AND CALCULATIONS.
14. GARAGE SLABS AND BASEMENT OVERDIGS SUPPORTED BY FILL CONSISTING OF MORE THAN 24" OF GRANULAR FILL OR 8" OF EARTH SHALL BE REINFORCED PER DETAILS 1-5-2.0 AND 6-S-2.0, RESPECTIVELY. WHERE THE LIMITATIONS OF DETAILS 1-5-2.0 AND 6-S-2.0 ARE NOTE MET, A SEPARATE ENGINEERED DESIGN SHALL BE REQUIRED.
15. BASEMENT FOUNDATION SILL PLATES SHALL BE BOLTED TO THE FOUNDATION WITH A MINIMUM OF 1/2" ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED AT LEAST MORE THAN 3'-0" ON CENTER AND WITHIN 12" OF EACH END PIECE.
16. FOUNDATION WALLS SHALL BE DAMP-PROOFED PER IRC SECTION R406.
17. PROVIDE A MINIMUM 4" PERFORATED DRAIN AROUND USABLE SPACE BELOW GRADE OR OTHER EQUIVALENT MATERIALS PER IRC SECTION 405.1. THE PIPE SHALL BE PLACED ON A MINIMUM OF 2" OF WASHED GRAVEL OR CRUSHED ROCK TO THE GROUND WITH NOT LESS THAN 6" DRAIN. THE DRAIN SHALL DRAIN TO THE EXTERIOR BELOW THE FLOOR LEVEL OR TERMINATE IN A MINIMUM 20 GALLON SUMP PUMP.
18. INTERIOR BEARING WALLS AND COLUMNS SHALL BE ISOLATED FROM THE BASEMENT FLOOR SLAB.
19. EXTERIOR BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.
20. ALL EARTH RETAINING STRUCTURES ON SITE GREATER THAN 4'-0" TALL (EXCLUDING CONCRETE FOUNDATION WALLS RESTRAINED AT BOTH THEIR TOP AND BOTTOM) SHALL REQUIRE A SEPARATE ENGINEERED DESIGN AS REQUIRED BY THE CODE AUTHORITY.
21. ANY GEOTECHNICAL IMPROVEMENT METHODS AND/OR STRUCTURAL CONDITIONS (SUCH AS DRILLED PILES) EMPLOYED TO ADDRESS UNACCEPTABLE SUBGRADE CONDITIONS SHALL BE SUBMITTED TO EOR AS ENGINEERED SHOP DRAWINGS FOR REVIEW AND APPROVAL.

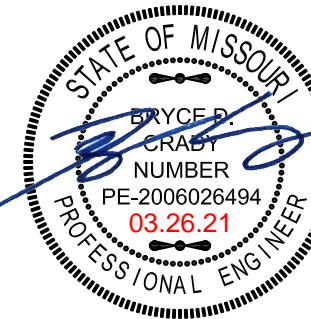
1. THE GARAGE FLOOR SHALL SLOPE TOWARDS THE GARAGE DOORWAYS.
2. DOORS BETWEEN THE GARAGE AND THE DWELLING - MINIMUM 1-3/8" SOLID CORE OR HONEY COMBED STEEL DOOR OR 20-MINUTE FIRE RATED.
3. THE GARAGE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY 5/8" TYPE X GYPSUM BOARD, OR EQUIVALENT MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION, APPLIED TO GARAGE SIDE. WHERE THE SEPARATION IS A FLOOR-CEILING ASSEMBLY, THE STRUCTURE SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED BY 5/8" TYPE X GYPSUM BOARD, OR MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION OR EQUIVALENT, APPLIED TO THE GARAGE SIDE. PULL DOWN STAIRS LOCATED WITHIN GARAGE SHALL BE RATED TO BE ADEQUATELY PROTECTED WITH MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION. ATTIC ACCESS PANELS LOCATED WITHIN GARAGE SHALL BE 5/8" TYPE X GYPSUM BOARD, OR MATERIALS FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION.
4. GARAGE DOOR AND FRAME- THE H-FRAME FOR THE ATTACHMENT OF THE TRACK AND COUNTER BALANCE SHALL CONSIST OF THE FOLLOWING: 2x6 VERTICAL BRACING FROM TOP OF DOOR TO CEILING, 2x6 HORIZONTAL BRACING WITH 1-3/4" x 1/20" NAILS AT 16" OC STAGGERED WITH (7) 3/4" x 1/20" NAILS THRU THE JAMB INTO THE HEADER, MINIMUM 2x8 HEADER FOR ATTACHMENT OF COUNTER BALANCE SYSTEM.

1. STAIRWAYS SHALL PROVIDE A MAXIMUM 7-3/4" RISE AND MINIMUM 10" RUN.
2. PROVIDE MINIMUM 36" GUARDRAILS ON THE OPEN SIDES OF RAISED FLOORS, PORCHES, AND BALCONIES; MINIMUM 34" GUARDRAILS ON THE OPEN SIDES OF STAIRWAYS LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW. GUARDRAIL ENCLOSURES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL PATTERNS THAT DO NOT ALLOW PASSAGE OF A SPHERE 4" IN DIAMETER.
3. PROVIDE A MINIMUM 4" FAIRWAY OF THREE OR MORE RISERS THAT PROVIDE A CONTINUOUS HANDRAIL ON AT LEAST ONE SIDE BETWEEN 34" AND 38" ABOVE THE NOSING OF THE TREADS.
4. HANDRAILS SHALL HAVE A CIRCULAR CROSS SECTION OF 1-1/4" MINIMUM TO 2" MAXIMUM OR OTHER APPROVED GRASPABLE SHAPE PER IRC SECTION 311.7.8.5.
5. PROVIDE A MINIMUM 6'-8" OF HEADROOM CLEARANCE IN STAIRWAYS.
6. ENCLOSED ACCESSIBLE SPACE UNDER STAIRWAYS SHALL HAVE WALLS AND THE UNDERSIDE OF THE STAIR AND LANDING PROTECTED WITH 1/2" GYPSUM BOARD ON ENCLOSURE SIDE PER IRC SECTION 302.7.
7. SPIRAL STAIRS TO BE CONSTRUCTED PER IRC SECTION 311.7.10.1.
8. SPACE STRINGERS AT 16" OC MAX.

THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING JURISDICTION.

APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS BE EVALUATED BY A LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOUNDATION ELEMENTS. GEOTECHNICAL INVESTIGATION AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX.

APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING BELOW THE BASEMENT SLAB), BY USE OF THESE PLANS WITHOUT AN ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT, APEX SHALL NOT BE HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING, DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.



STRUCTURAL DESIGN REVIEW  
KANSAS ENGINEERING LICENSE  
E-992  
MISSOURI ENGINEERING LICENSE  
2003004673

PROJECT:  
Lot #3 Whispering Woods (The Brooklyn)  
1920 SW River Run Dr.

Lee's Summit, MO 64082

**CLIENT:**  
New Mark Homes

PROJECT #:	20-090
DRAWN BY:	TDA
CHECKED BY:	BDC
SUBMITTAL DATE:	2021.03.26

[illegible]

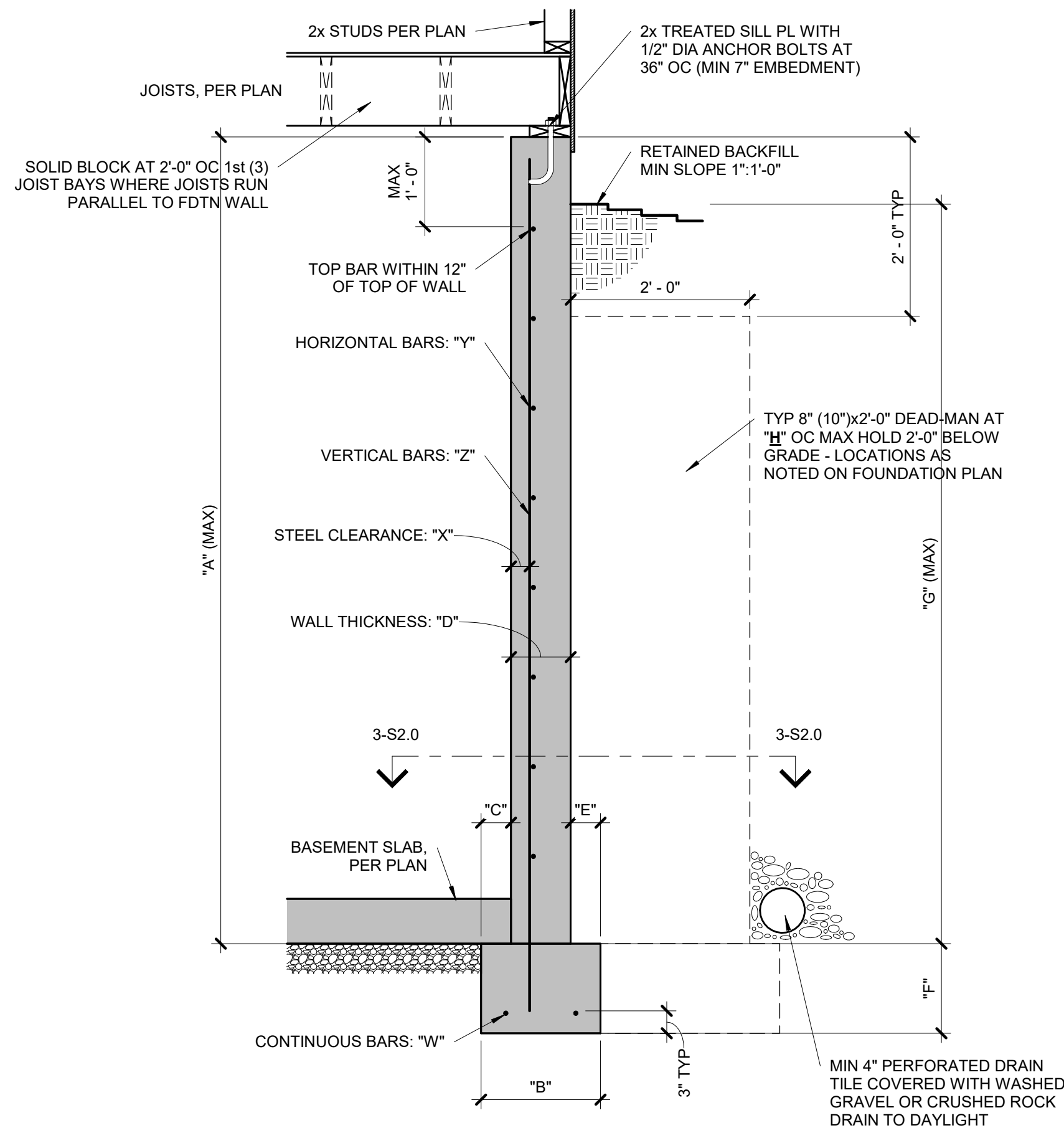
T:

### GENERAL NOTES

**RELEASE FOR  
CONSTRUCTION  
AS NOTED ON PLANS REVIEW  
DEVELOPMENT SERVICES  
LEE'S SUMMIT, MISSOURI**

03/30/2021





#### CONCRETE DIMENSIONS

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
8'-0"	1'-4"	4"	8"	4"	8"	7'-6"	20'-0"
9'-0"	1'-4"	4"	8"	4"	8"	8'-6"	20'-0"
10'-0"	1'-8"	5"	10"	5"	10"	9'-6"	20'-0"

#### REINFORCING BARS(GRADE 40 BARS)

"W"	"X"	"Y"	"Z"
(2) #4	2 1/2"	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	2 1/2"	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	2 1/2"	#4 BARS AT 18" OC	#4 BARS AT 18" OC

- NOTES:
- DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH.
  - VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF TOP AND BOTTOM OF WALL.
  - BURIED CONCRETE FOUNDATION WALLS UP TO 9'-0" TALL MAY BE 8" NOMINAL THICKNESS WITH #4 BARS AT 24" OC BOTH WAYS OVER 16"x8" CONCRETE FOOTINGS WITH (2) #4 BARS CONTINUOUS, UNLESS OTHERWISE REQUIRED BY ENGINEERING REPORT BASED ON ACTUAL SITE CONDITIONS.
  - WALL WILL NOT ACHIEVE FULL STRENGTH UNTIL FIRST FLOOR DECK AND BASEMENT SLAB HAVE BEEN PLACED.

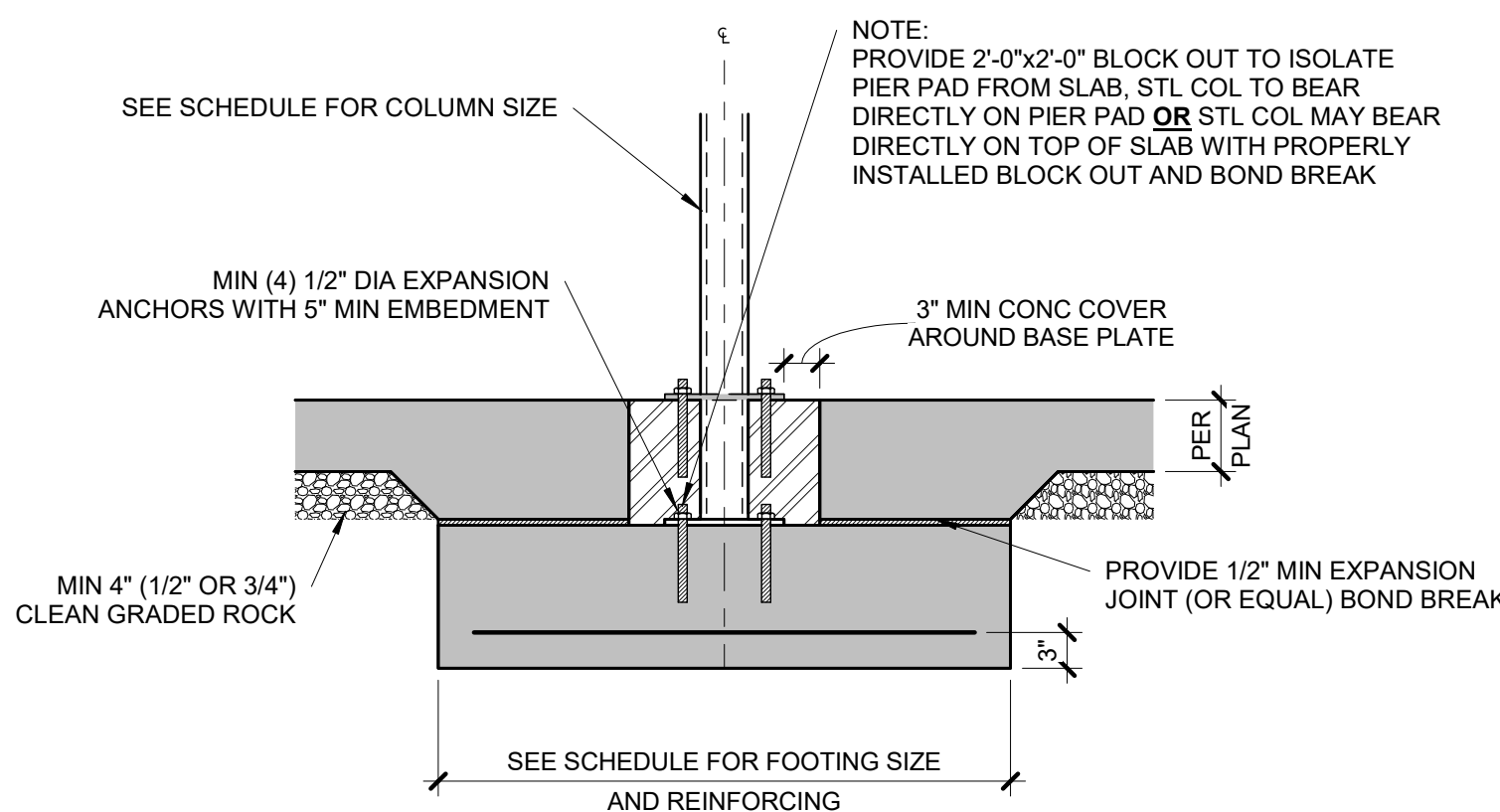
#### TYPICAL FOUNDATION WALL

1  
S2.0 3/4" = 1'-0"

#### COLUMN AND PIER PAD SCHEDULE

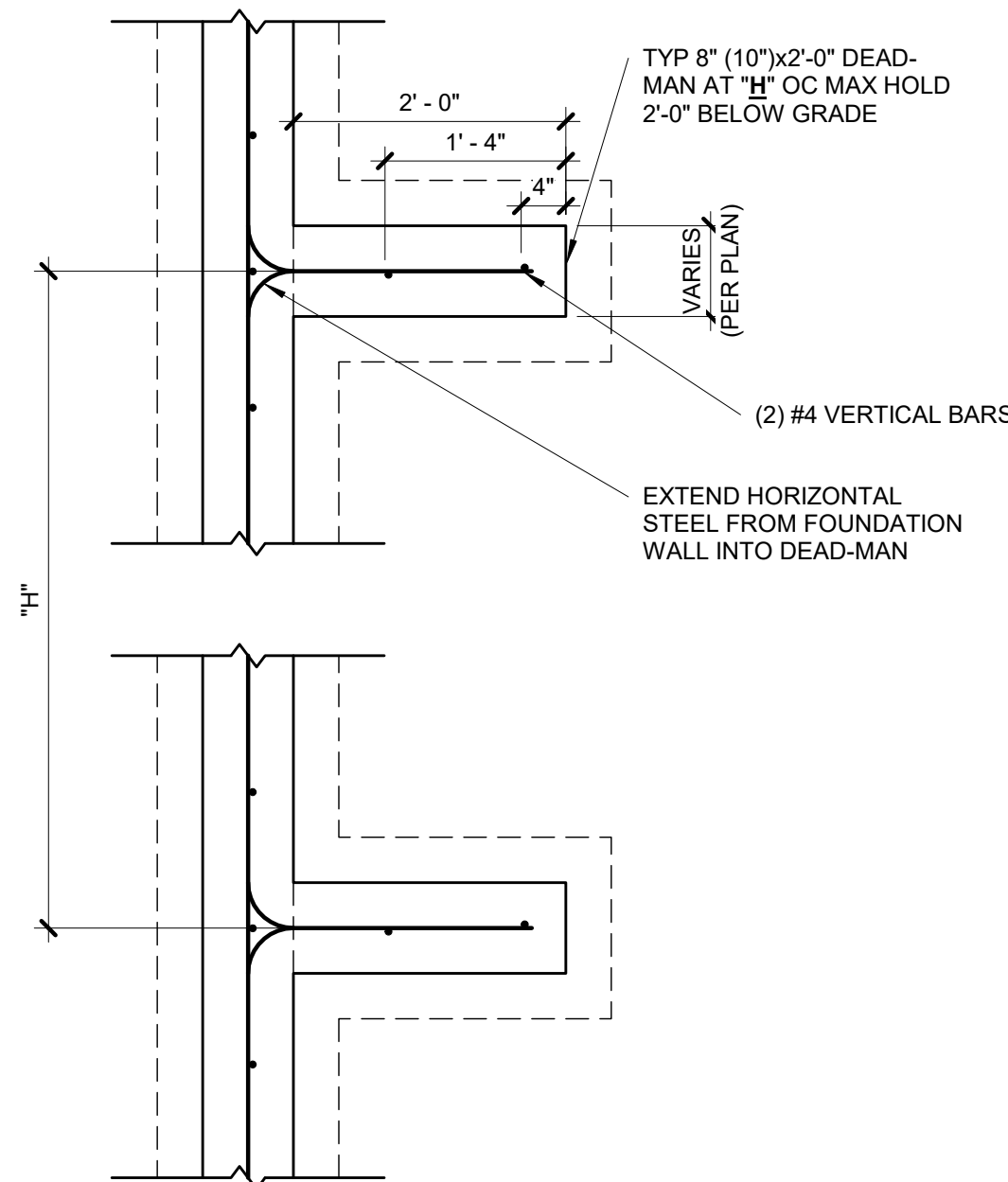
COLUMN MARK	PAD SIZE	REINFORCING	COL SIZE	COL TYPE
A	30"x30"x12"	(4) #4 BARS E-W	3" NOMINAL	SCHEDULE 40 STEEL COLUMN (FY = 58 ksi MIN)
B	36"x36"x12"	(4) #4 BARS E-W	3" NOMINAL	
C	42"x42"x12"	(5) #4 BARS E-W	3" NOMINAL	
D	48"x48"x12"	(6) #4 BARS E-W	3" NOMINAL	
E	54"x54"x16"	(8) #4 BARS E-W	3 1/2" NOMINAL (4" OD)	
F	60"x60"x16"	(10) #4 BARS E-W	3 1/2" NOMINAL (4" OD)	

- NOTES:
- COLUMN AND PIER PAD SIZES SHOWN ARE FOR MAXIMUM COLUMN HEIGHT OF 10'-0". REQUIRES SEPERATE ENGINEERED DESIGN IF GREATER THAN 10'-0"
  - COLUMN AND PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 2,000 PSF.



#### 5 COLUMN PAD DETAIL

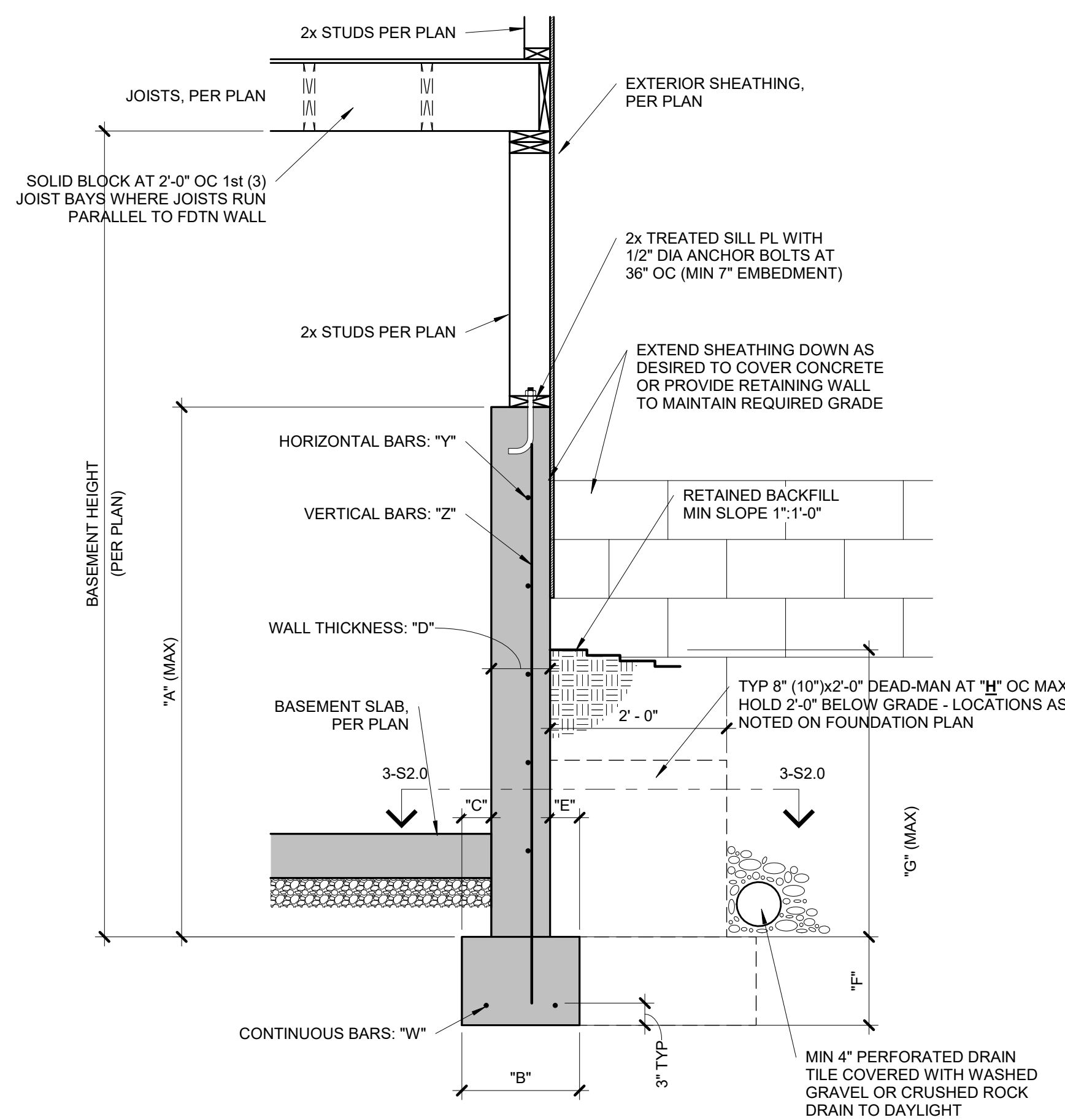
S2.0 3/4" = 1'-0"



- NOTES:
- MIN 3000 PSI FOOTING COMPRESSIVE CONCRETE STRENGTH.
  - MIN 3000 PSI WALL COMPRESSIVE CONCRETE STRENGTH.
  - AIR ENTRAINED BETWEEN 5% & 7% OF CONCRETE VOLUME.
  - GRADE 40 REINFORCING STEEL UNLESS OTHERWISE NOTED.
  - LAP SPLICES 24" MIN.
  - WALL SHALL BE BACK-FILLED WITH CLEAN, LEAN CLAY (OR BETTER) LOW VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER.
  - ASSUMED 2,000 PSF BEARING (TO BE VERIFIED BY GEOTECHNICAL ENGINEER).

#### 3 TYPICAL DEAD-MAN SECTION

S2.0 3/4" = 1'-0"



#### CONCRETE DIMENSIONS

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
4'-0"	1'-4"	4"	8"	4"	8"	3'-4"	20'-0"
6'-0"	1'-4"	4"	8"	4"	8"	4'-4"	20'-0"
9'-0"	1'-8"	5"	8"	4"	8"	4'-4"	20'-0"

#### REINFORCING BARS(GRADE 40 BARS)

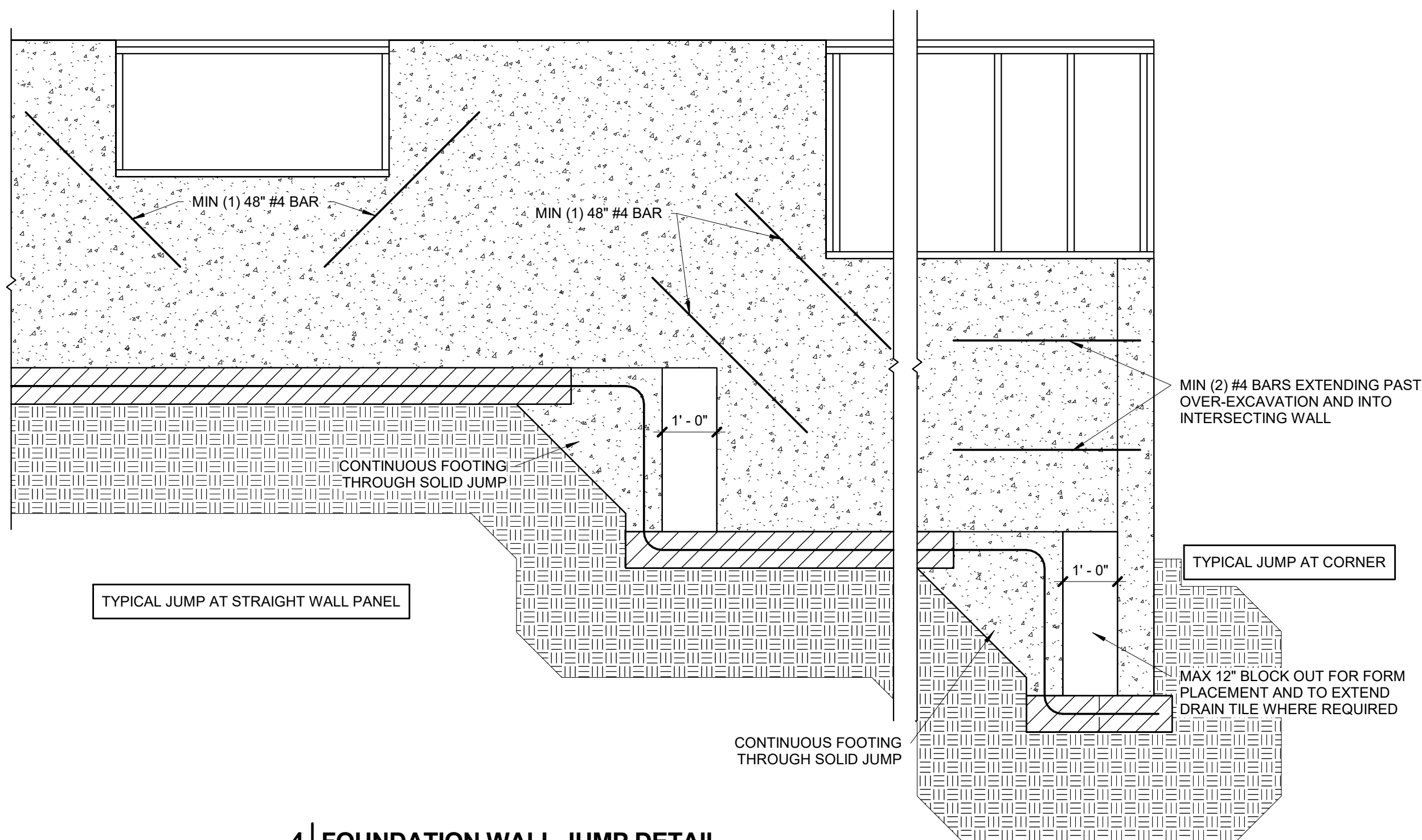
"W"	"X"	"Y"	"Z"
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC
(2) #4	N/A	#4 BARS AT 24" OC	#4 BARS AT 24" OC

- NOTES:
- DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH.
  - VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF TOP AND BOTTOM OF WALL.
  - THE BASEMENT SLAB IS AN INTEGRAL PART OF THE 'UNRESTRAINED' FOUNDATION WALL DESIGN THEREFORE, IF THE WALL IS BACKFILLED PRIOR TO PLACEMENT OF THE BASEMENT SLAB, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BRACING THE WALL UNTIL THE BASEMENT SLAB HAS BEEN PLACED.

#### TYPICAL 'UNRESTRAINED'

#### 2 FOUNDATION WALL DETAIL

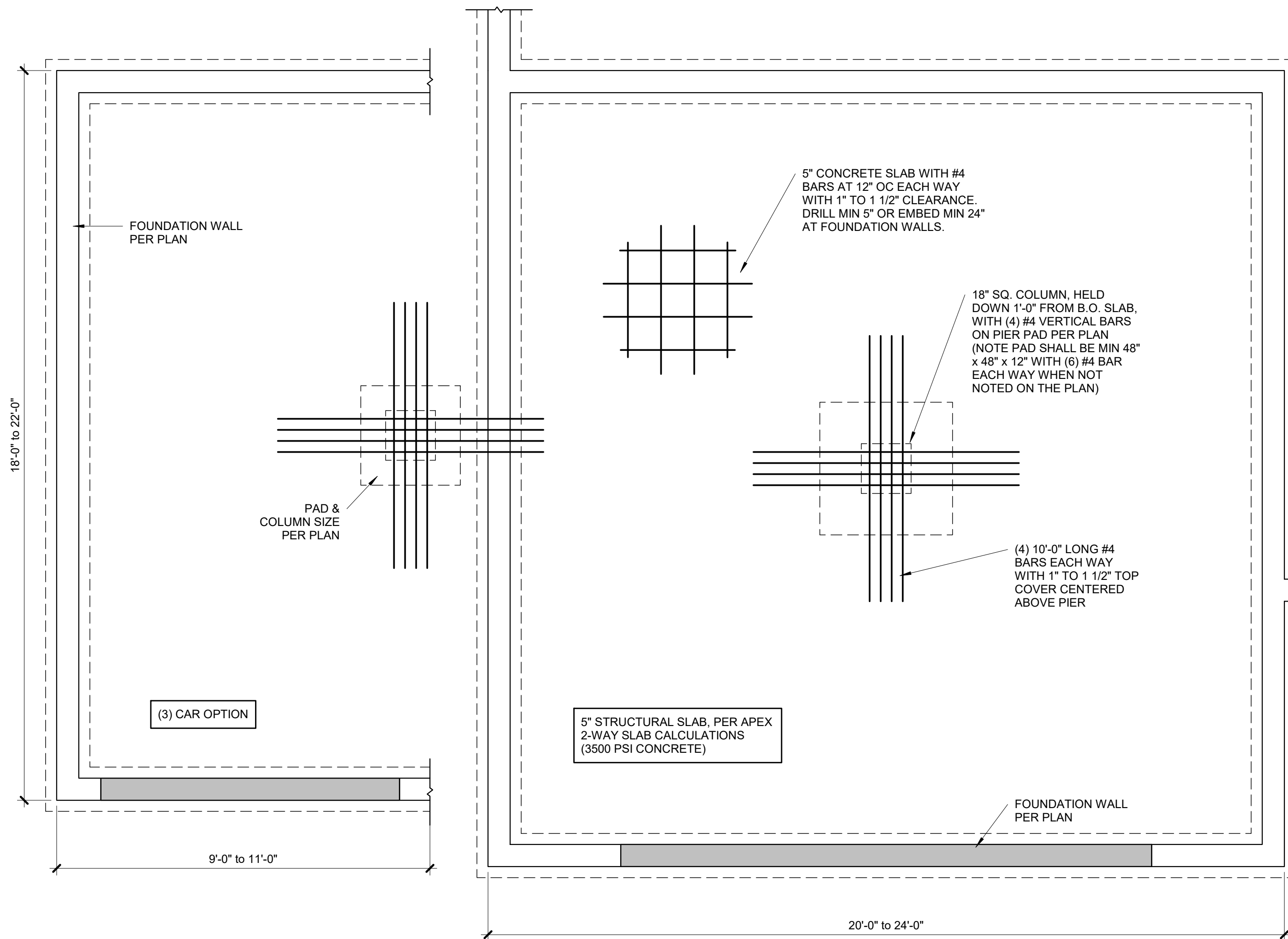
S2.0 3/4" = 1'-0"



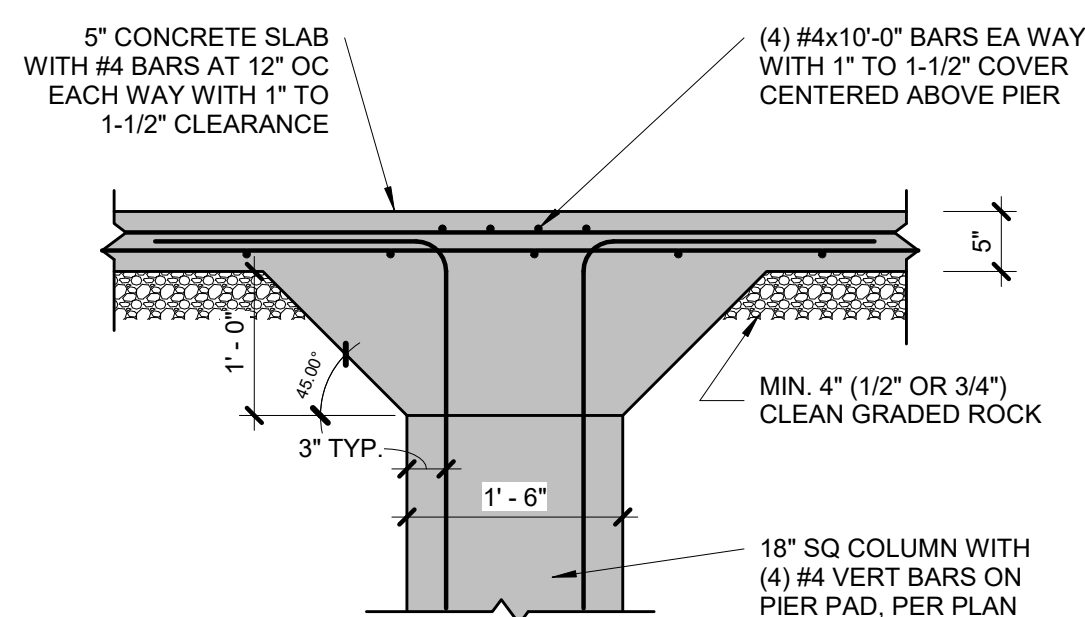
#### 4 FOUNDATION WALL JUMP DETAIL

S2.0 1/2" = 1'-0"

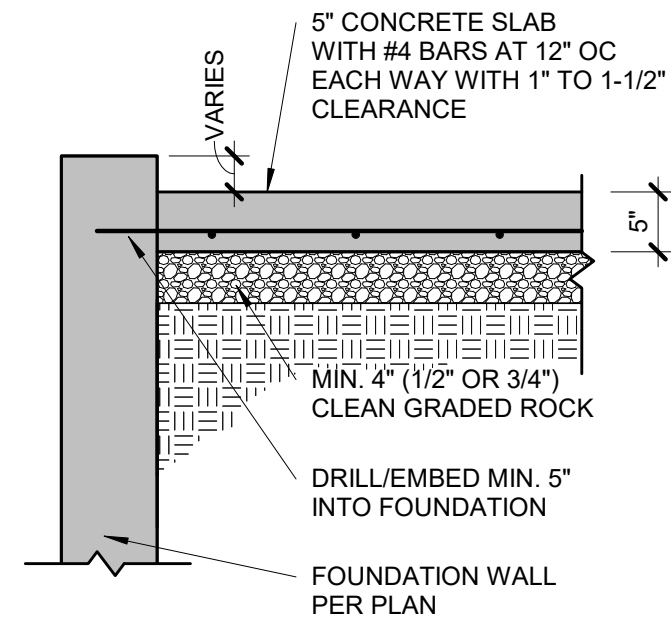




**1 TYPICAL STRUCTURAL GARAGE SLAB PLAN**  
S2.1 3/4" = 1'-0"

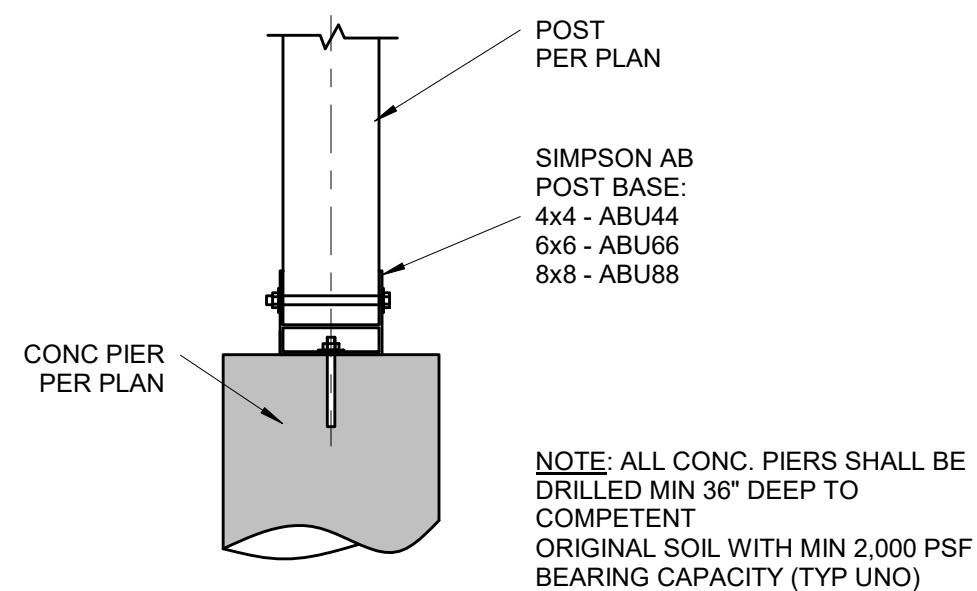


**2 STRUCTURAL GARAGE SLAB PIER PAD DETAIL**  
S2.1 3/4" = 1'-0"

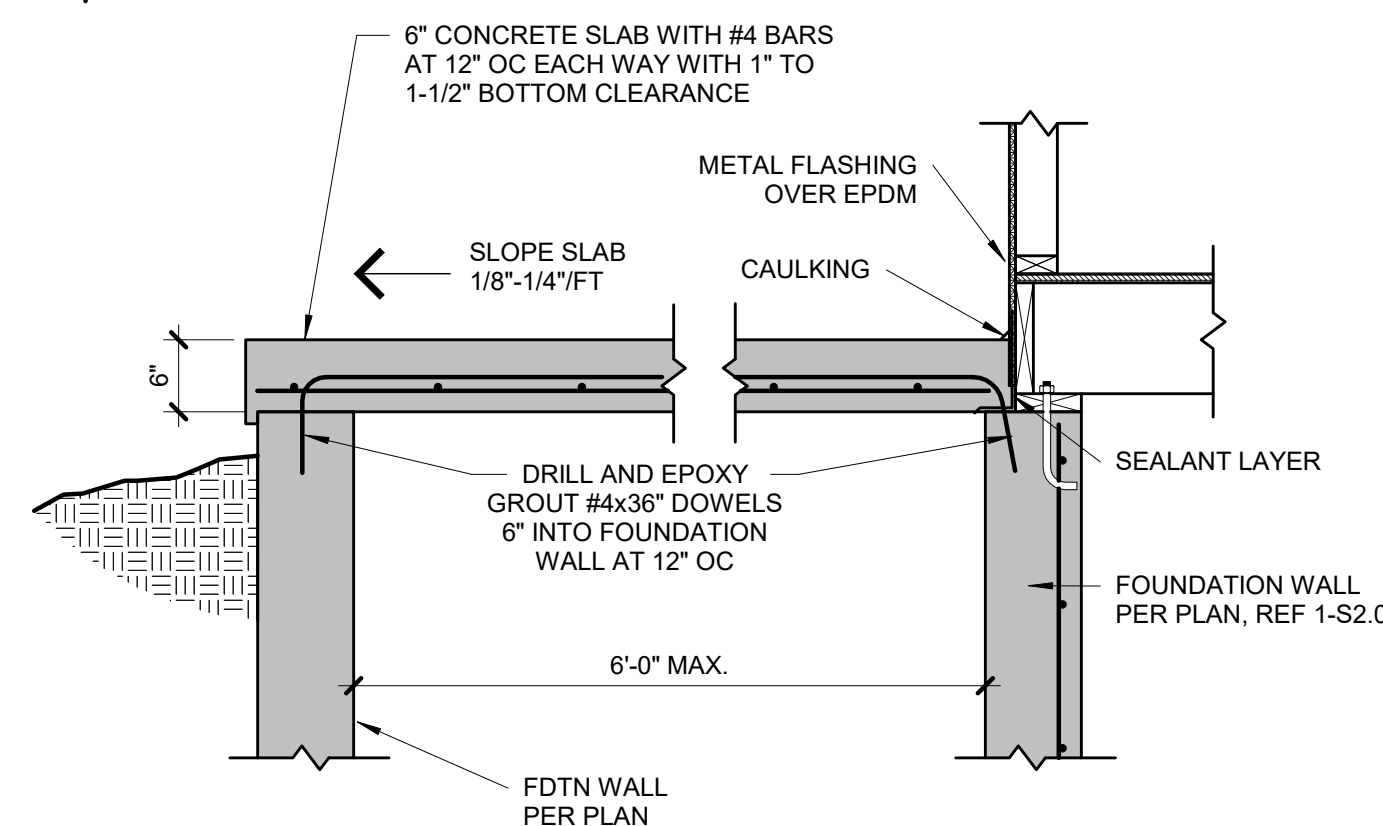


**3 STRUCTURAL GARAGE SLAB/WALL SECTION**  
S2.1 3/4" = 1'-0"

PIER SCHEDULE		
COLUMN MARK	COL SIZE	PIER DIAMETER
G	PER PLAN	12"
H	PER PLAN	16"
J	PER PLAN	18"
K	PER PLAN	24"
L	PER PLAN	28"



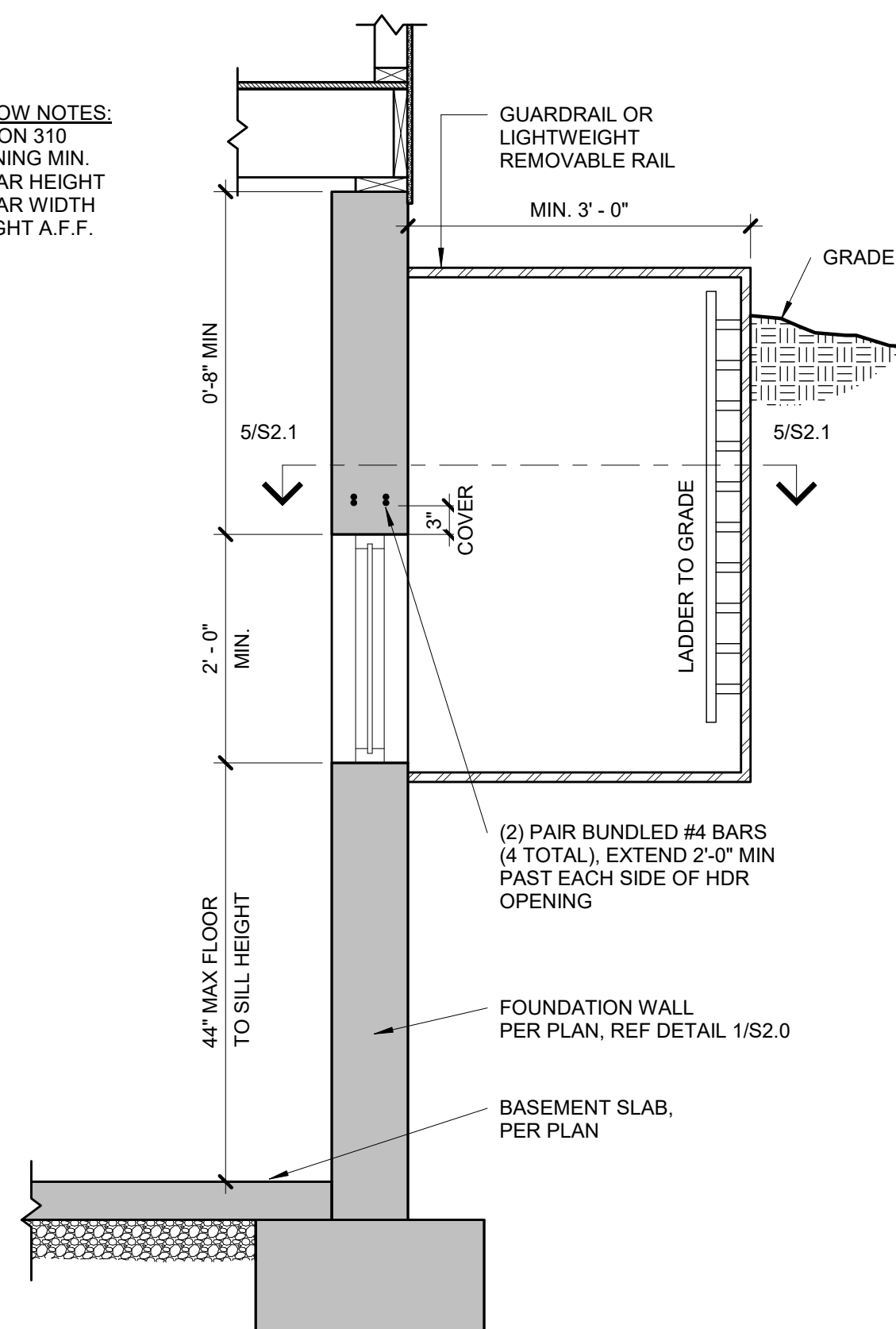
**8 POST BASE DETAIL**  
S2.1 3/4" = 1'-0"



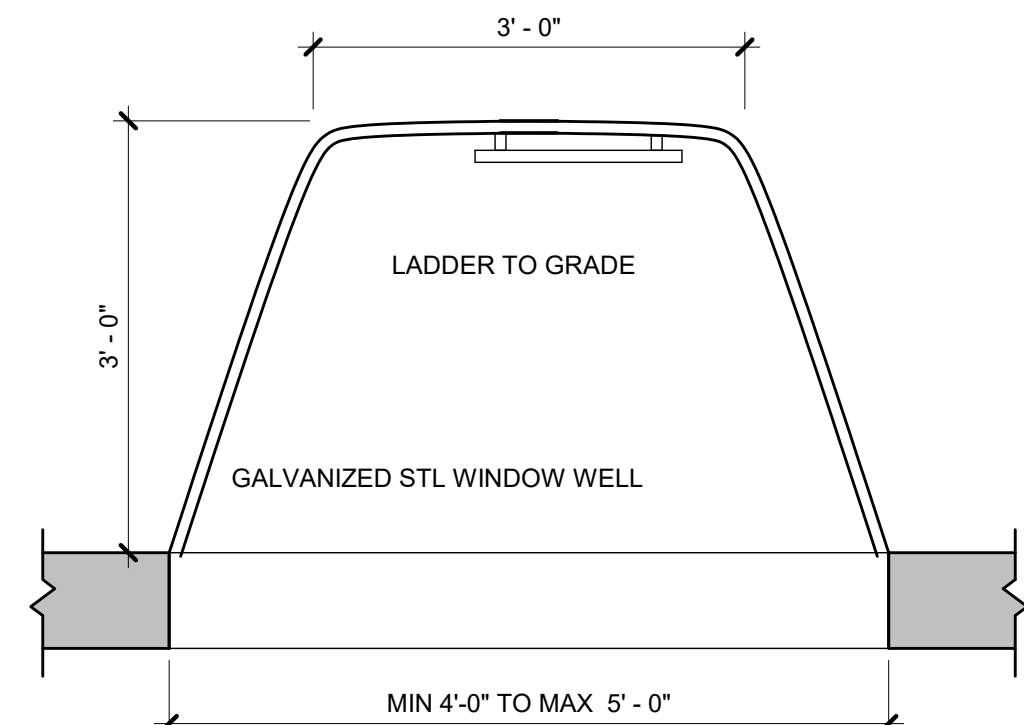
FORMWORK OPTIONS:  
1. PROVIDE VULCRAFT 2VLI (OR EQUAL) CORRUGATED DECKING (SHORE AT MID-SPAN DURING CONSTRUCTION), OR  
2. PLYWOOD FORMS WITH EXPANDABLE BAR JOISTS OR TEMPORARY FRAMED WALLS BY CONTRACTOR.

**7 SUSPENDED PORCH STOOP DETAIL**  
S2.1 3/4" = 1'-0"

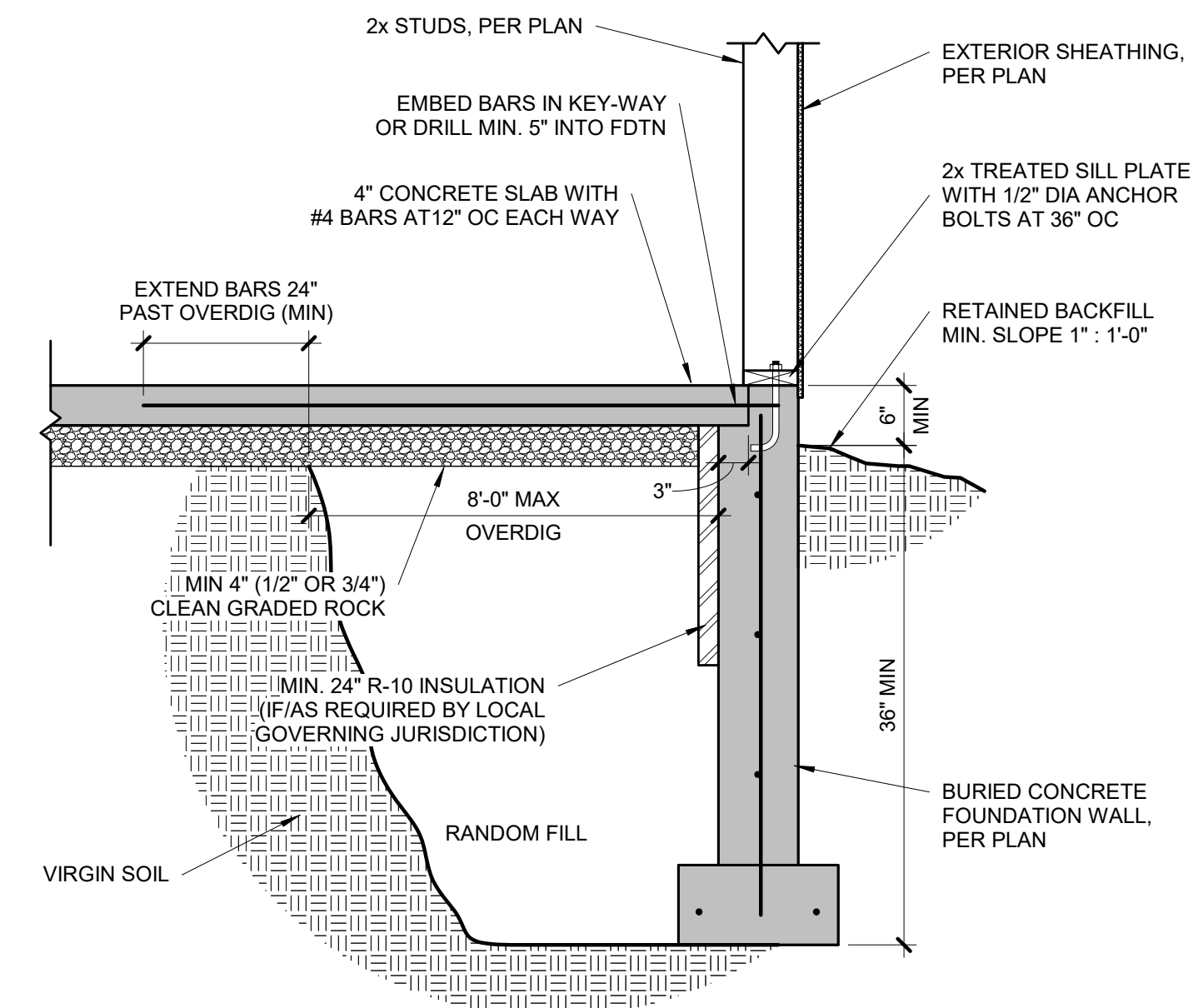
EGRESS WINDOW NOTES:  
PER IRC SECTION 310  
1. 5.7 S.F. OPENING MIN.  
2. 24" MIN. CLEAR HEIGHT  
3. 20" MIN. CLEAR WIDTH  
4. 44" MAX HEIGHT A.F.F.



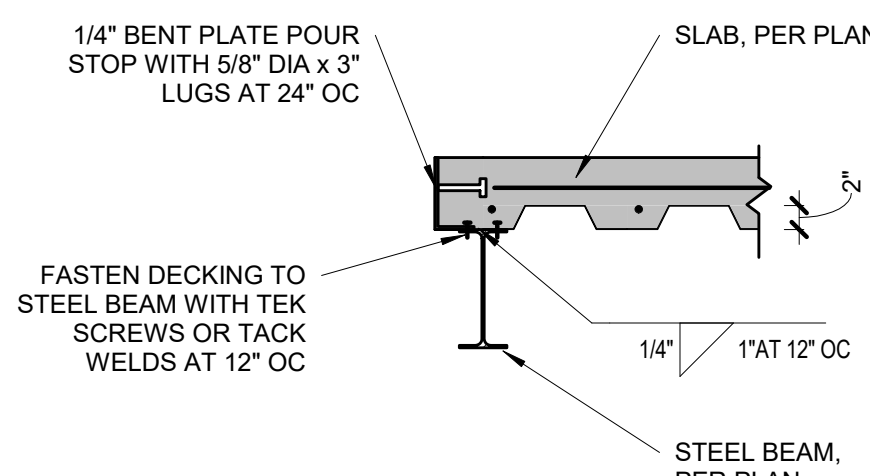
**4 TYPICAL EGRESS WINDOW SECTION DETAIL**  
S2.1 3/4" = 1'-0"



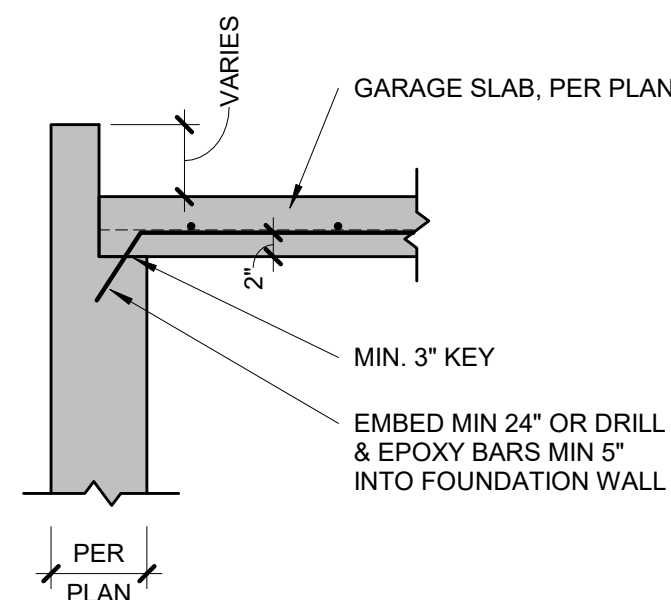
**5 TYPICAL EGRESS WINDOW PLAN**  
S2.1 3/4" = 1'-0"



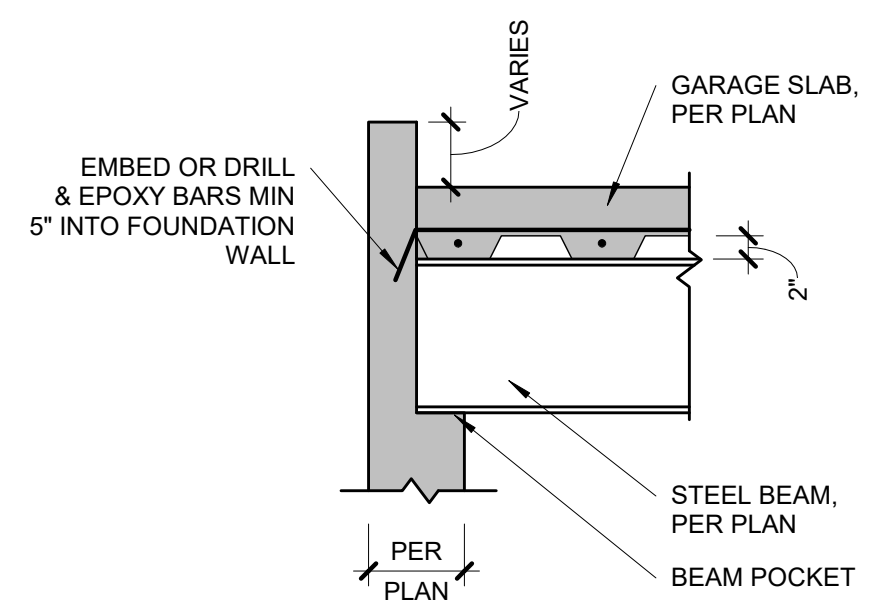
**6 TYPICAL OVERDIG DETAIL AT BASEMENT SLAB**  
S2.1 3/4" = 1'-0"



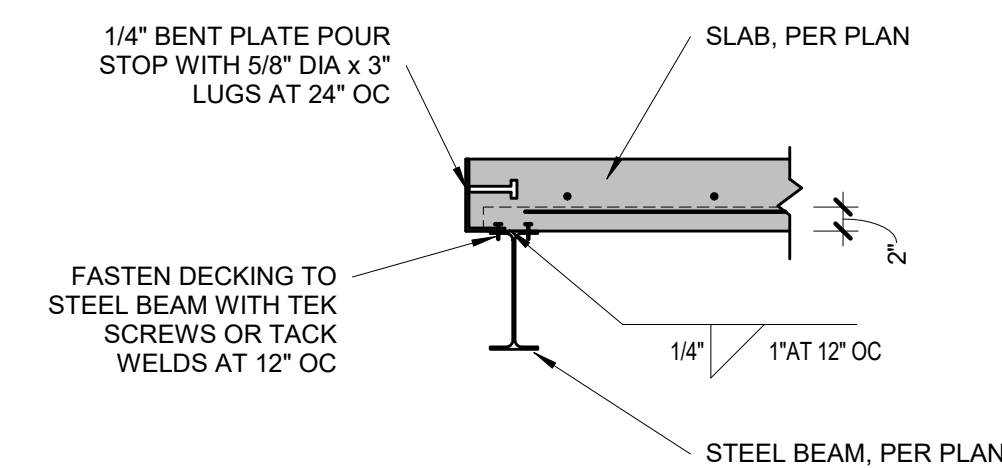
**9 POUR STOP DETAIL**  
S2.1 3/4" = 1'-0"



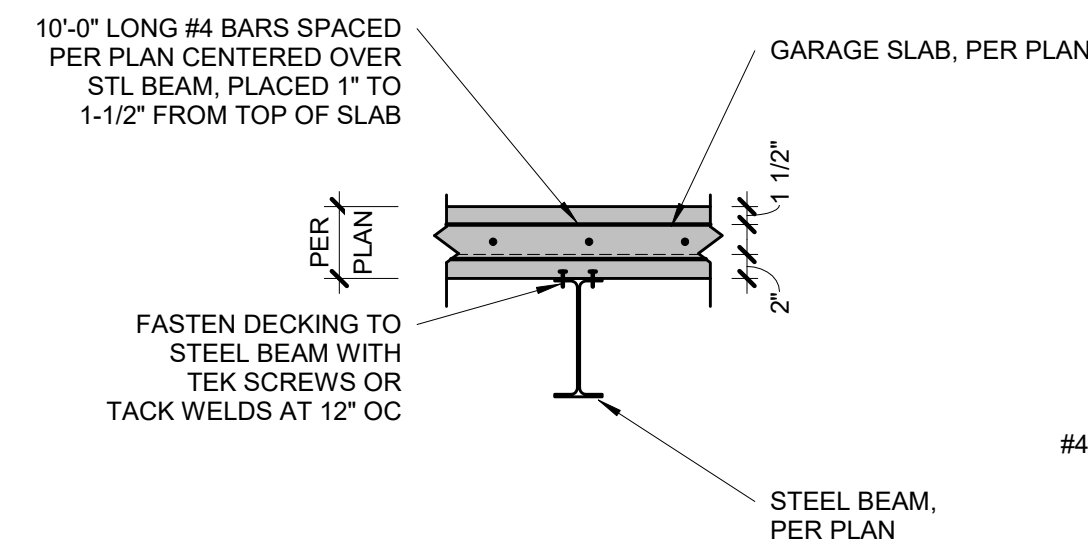
**10 GARAGE SLAB BEARING**  
S2.1 3/4" = 1'-0"



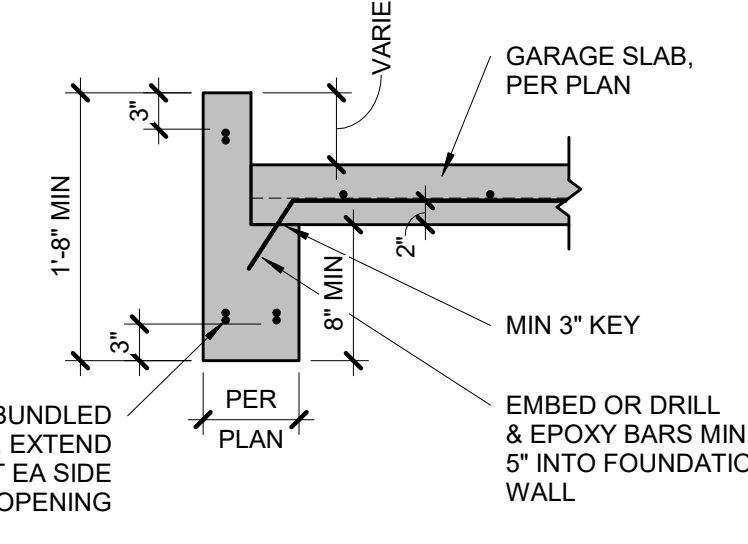
**11 GARAGE SLAB BEAM BEARING**  
S2.1 3/4" = 1'-0"



**12 POUR STOP DETAIL**  
S2.1 3/4" = 1'-0"



**13 GARAGE SLAB BEAM BEARING**  
S2.1 3/4" = 1'-0"

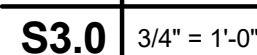
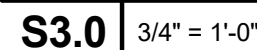


**14 CONCRETE HEADER DETAIL**  
S2.1 3/4" = 1'-0"

**TYPICAL SUSPENDED SLAB DETAIL**

STEEL DECKING NOTES:  
• MINIMUM 1-1/2" BEARING  
• FASTEN TO SUPPORT STEEL WITH 5/8" VISIBLE PUDDLE WELDS AT EDGE RIBS AND 12" CENTERS ALONG END BEARING  
• FASTEN SIDE LAPS AND PERIMETER EDGES AT 36" CENTERS WITH #10 TEK SCREWS OR 5/8" PUDDLE WELDS  
• MAX UNSUPPORTED CONSTRUCTION SPAN 6'-0", UNO ON PLANS BY APEX



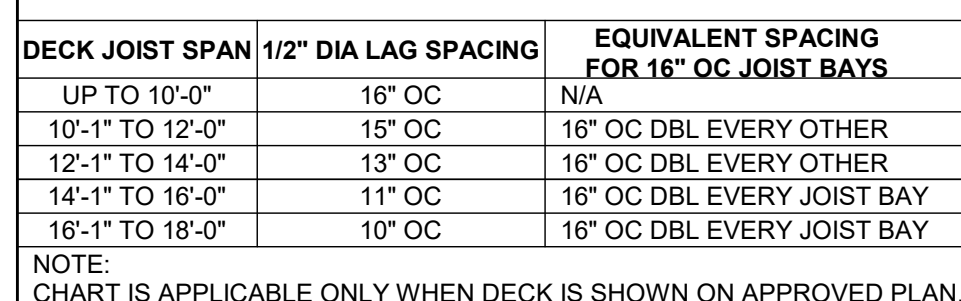
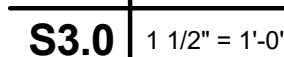
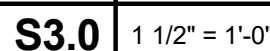


A. LISTED HEIGHTS ARE DISTANCES BETWEEN POINTS OF LATERAL SUPPORT PLACED PERPENDICULAR TO THE PLANE OF THE WALL. BEARING WALLS SHALL BE SHEATHED ON NOT LESS THAN ONE SIDE OR BRIDGING SHALL BE INSTALLED NOT GREATER THAN 4 FEET APART MEASURED VERTICALLY FROM EITHER END OF THE WALL OR BRIDGE. THE WALL STUDDED HEIGHT ARE PERMITTED WHERE IN THE COMPLIANCE WITH EXCEPTION 2 OF SECTION R602.3.1 OR DESIGNED IN COMPLIANCE WITH ACCEPTED ENGINEERING PRACTICE.

B. A HABITABLE ATTIC ASSEMBLY SUPPORTED BY 2x4 STUDS IS LIMITED TO A ROOF SPAN OF 32 FEET. WHERE THE ROOF SPAN EXCEEDS 32 FEET, THE WALL STUDDED HEIGHT SHALL BE INCREASED TO 2x6 OR THE STUDS SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

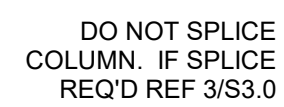
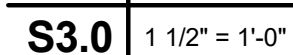
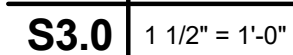
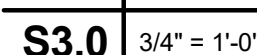
A. WALL STUDS NOT EXCEEDING 16" OC SHALL BE SHEATHED WITH MINIMUM 1/2" GYPSUM BOARD ON THE INTERIOR AND 3/8" WOOD STRUCTURAL PANEL SHEATHING ON THE EXTERIOR. WOOD STRUCTURAL PANEL SHEATHING SHALL BE ATTACHED WITH 8d (2.5" x 0.131") NAILS NOT GREATER THAN 6" OC ALONG PANEL EDGES AND 12" OC AT INTERMEDIATE SUPPORTS, AND ALL PANEL JOINTS SHALL OCCUR OVER STUDS OR BLOCKING.

B. THE MAXIMUM SPAN IS APPLICABLE TO BOTH SINGLE AND MULTIPLE SPAN ROOF AND FLOOR CONDITIONS. THE ROOF ASSEMBLY SHALL NOT CONTAIN A HABITABLE ATTIC.



<b>S3.0</b>	3/4" = 1'-0"
-------------	--------------

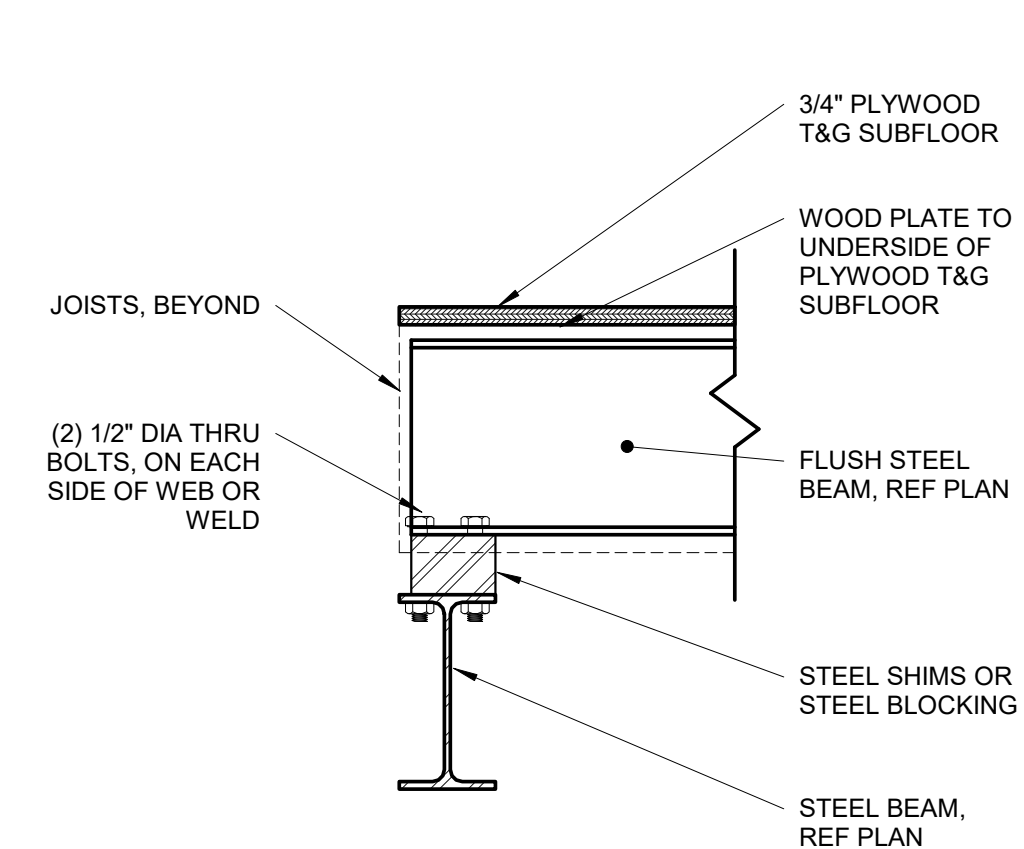
\*DISTANCE SHALL BE PERMITTED TO BE REDUCED TO 4 1/2" IF LAG SCREWS ARE USED OR BOLT SPACING IS REDUCED TO THAT OF LAG SCREWS TO ATTACH 2x8 LEDGERS TO 2x8 BAND JOISTS



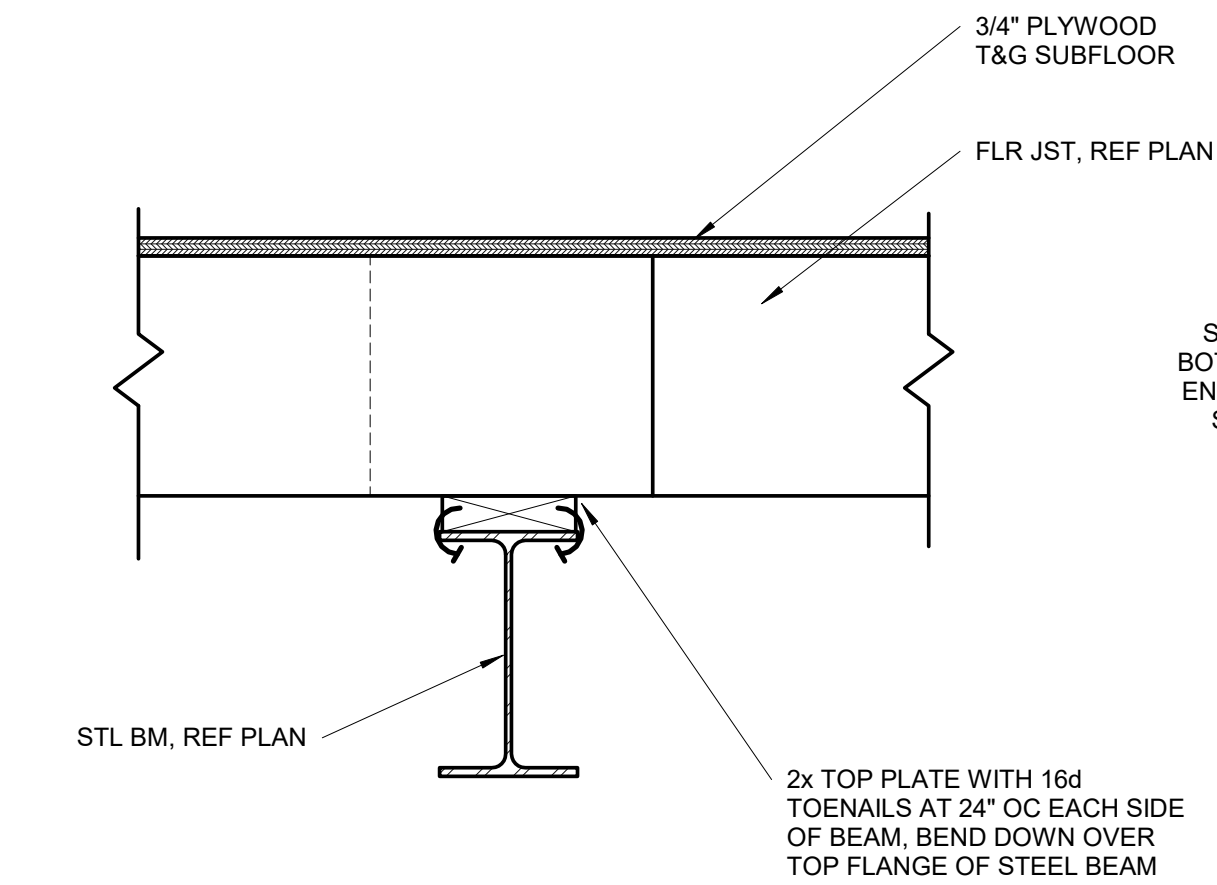
<b>S3.0</b>	1 1/2" = 1'-0"
-------------	----------------



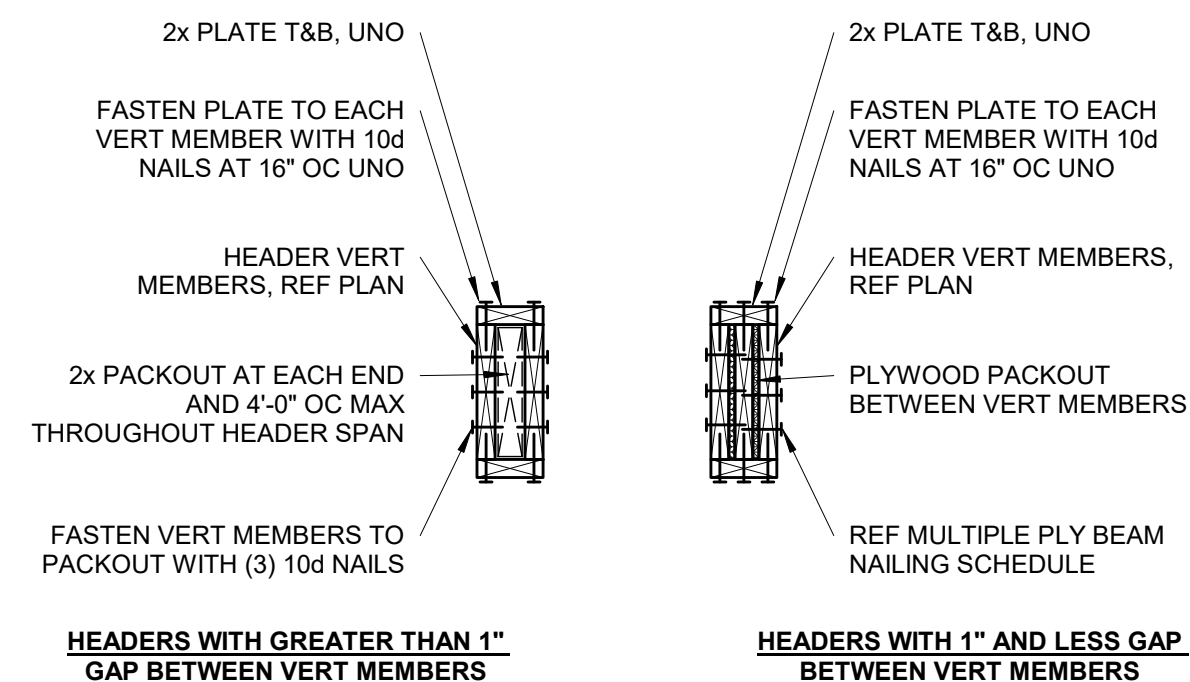




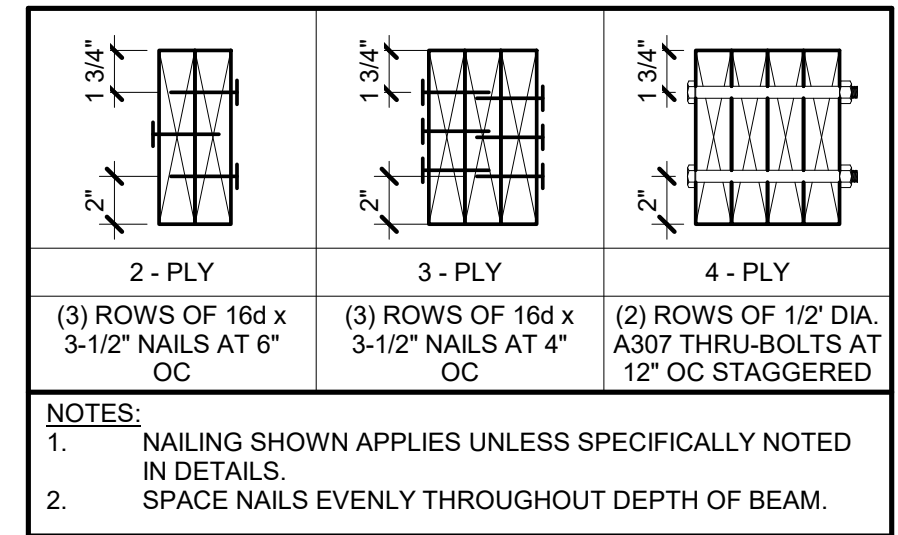
**9 FLUSH STEEL BEAM TO STEEL BEAM**  
**S3.1** 1 1/2" = 1'-0"



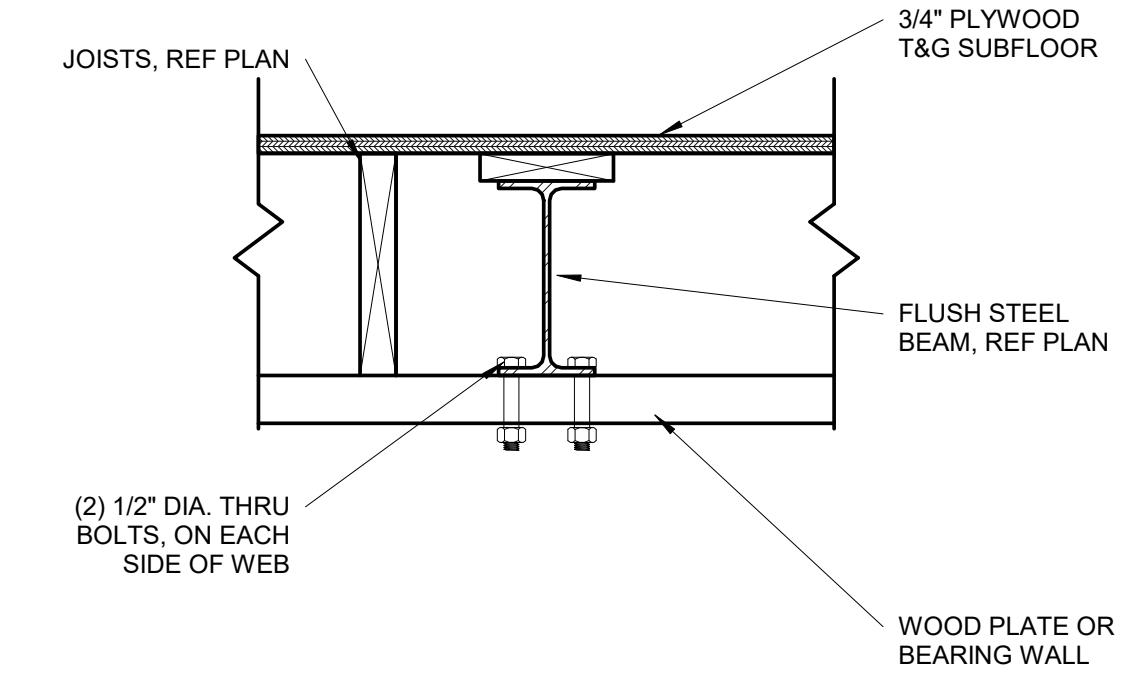
**8 WOOD PLATE TO STEEL BEAM CONNECTION**  
**S3.1** 1 1/2" = 1'-0"



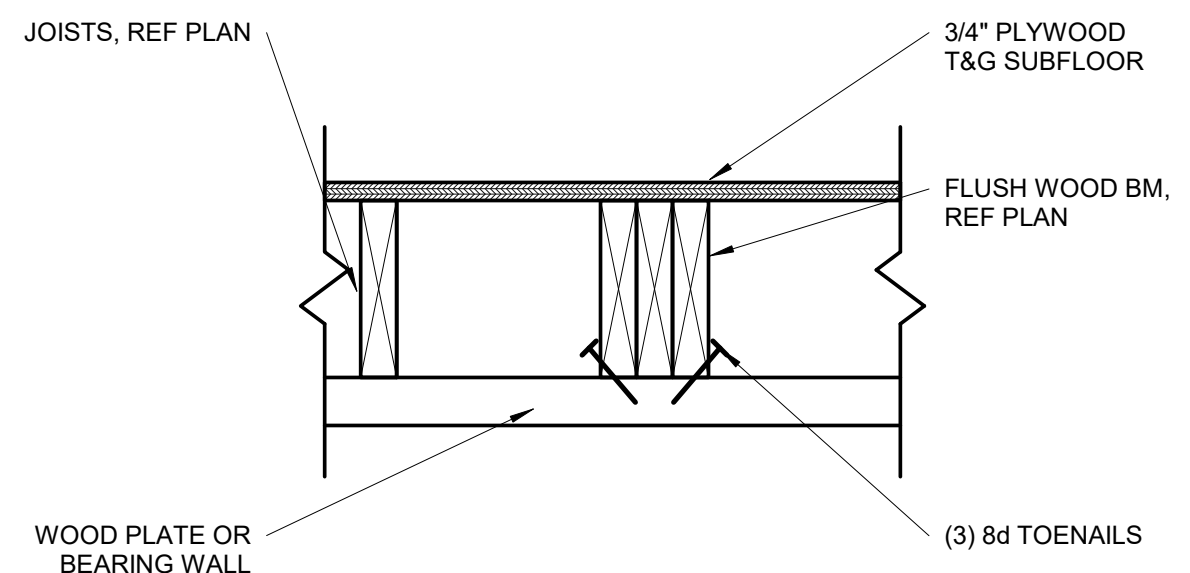
**11 TYPICAL WOOD HEADER DETAIL**  
**S3.1** NOT TO SCALE



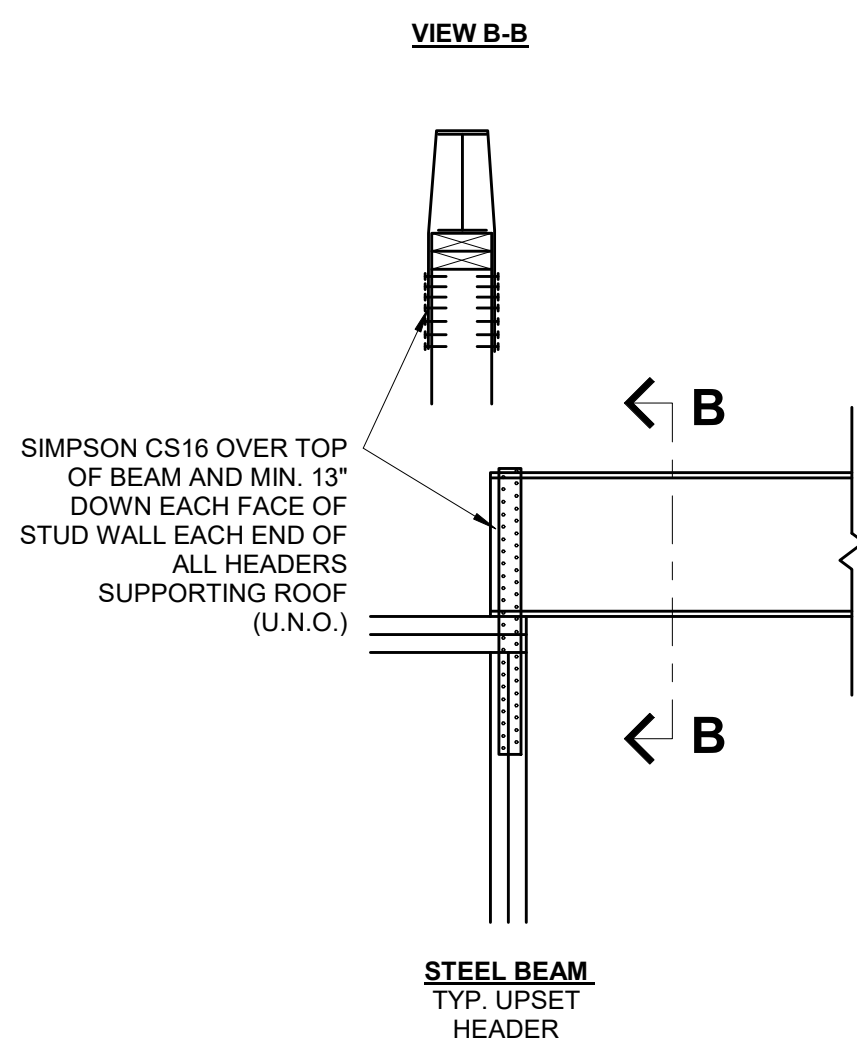
**10 MULTIPLE PLY BEAM NAILING SCHEDULE**  
**S3.1** NOT TO SCALE



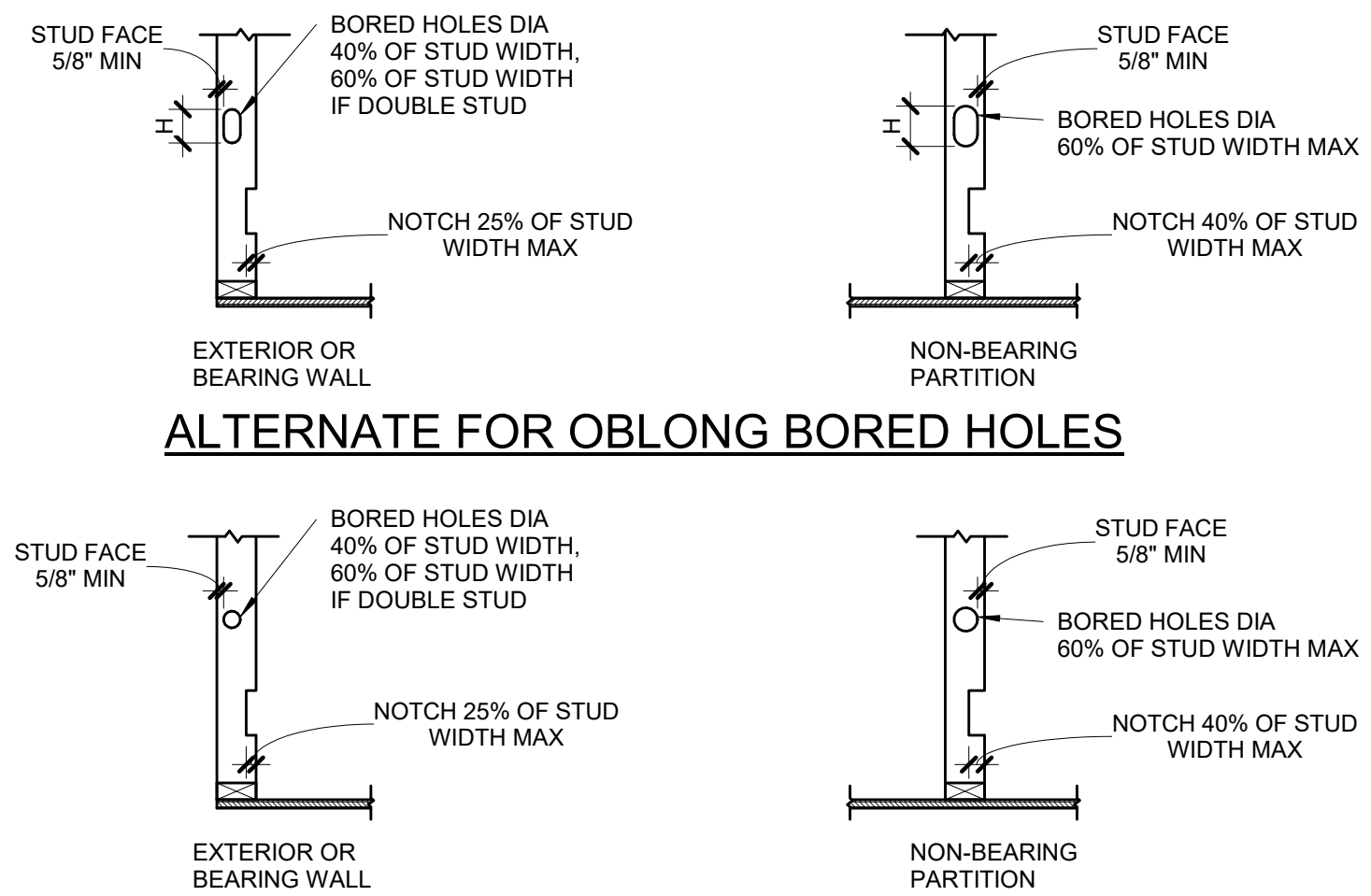
**7 FLUSH STEEL BEAM CONNECTION**  
**S3.1** 1 1/2" = 1'-0"



**6 FLUSH WOOD BEAM CONNECTION**  
**S3.1** 1 1/2" = 1'-0"



**5 ROOF SUPPORTING BEAM HOLD DOWN**  
**S3.1** 3/4" = 1'-0" (COMPLIANCE WITH IRC R802.11)

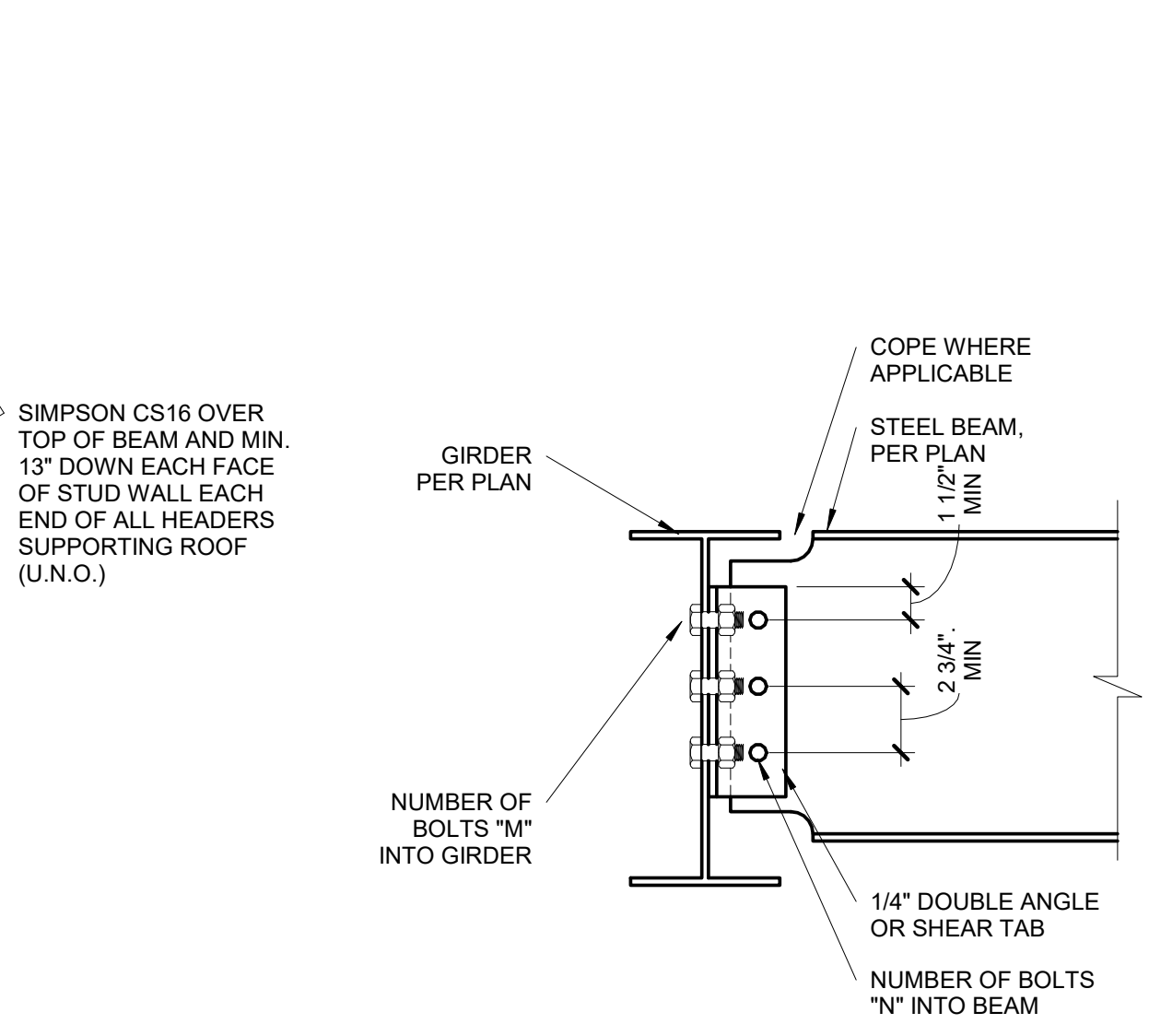


WALL SIZE	BORED HOLE SIZE		WALL NOTCH	
	STUDS LOAD BEARING OR EXTERIOR WALL	NON LOAD BEARING WALL	LOAD BEARING WALL	NON LOAD BEARING WALL
	40%	60%	25%	40%
2x4	1 3/8"	-	7/8"	1 3/8"
(2) 2x4	-	2 1/8"	7/8"	1 3/8"
2x6	2 1/4"	3 15/16"	1 3/8"	2 1/4"
(2) 2x6	-	3 5/16"	1 3/8"	2 1/4"
2x8	2 7/8"	-	1 13/16"	2 7/8"
(2) 2x8	-	4 3/8"	1 13/16"	2 7/8"

PLATES:	WALL SIZE	HOLE SIZE	VERTICAL HOLE SIZE (H)
TOP AND BOTTOM PLATE HOLE, CUT OR NOTCH THAT IS 50% MORE OF WIDTH MUST BE REPAIRED USING 16 GA (MIN) METAL TIE THAT IS AT LEAST 1-1/2" WIDE IF WALL IS A SHEAR WALL IT MUST BE REPAIRED USING HARDY FRAME SADDLE (HFS).	2x4	1 3/4"	D+1/2" AT Lvl's 1&2
	2x6	2 3/4"	D+1" AT Lvl 3
	2x8	3 5/8"	D+1 1/4" AT Lvl 4
			D+1 1/2" AT Lvl 5

NOTE:  
SEE SECTION R602.6 AND FIGURES R602.6.1 AND R602.6.2

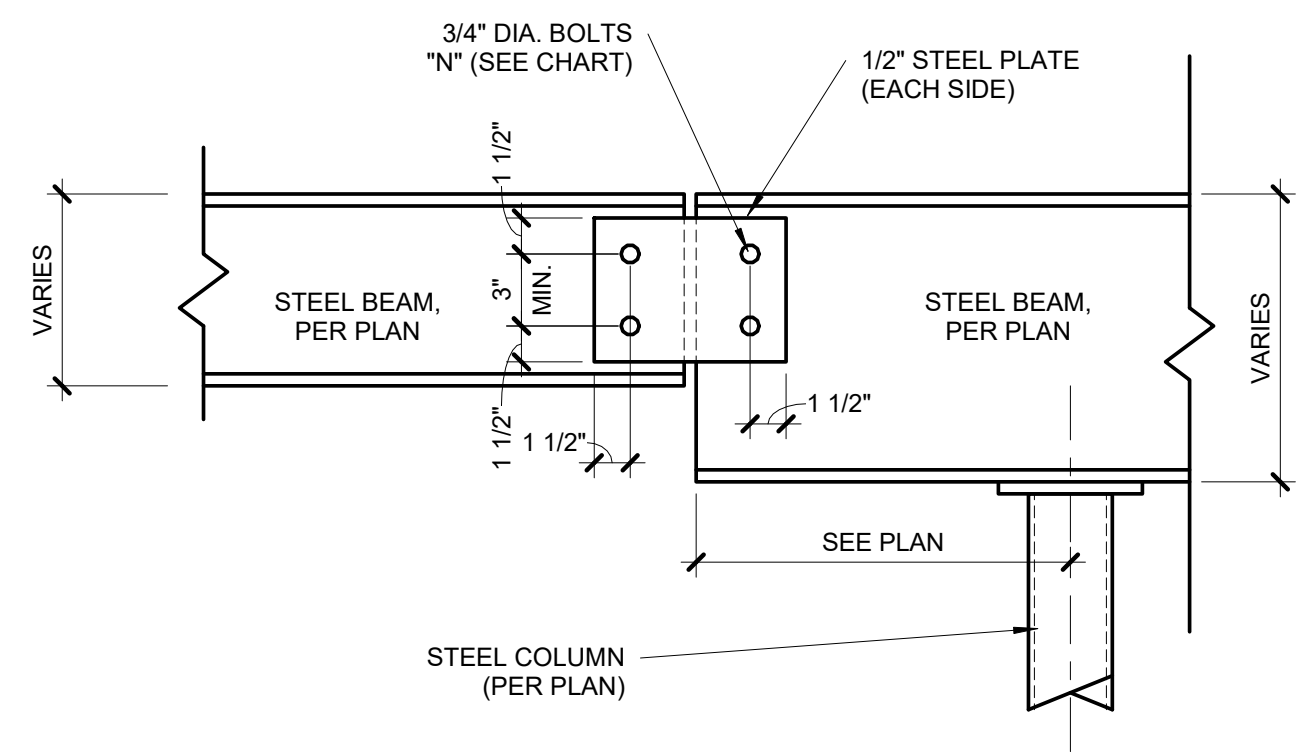
**4 DRILLING & NOTCHING DETAIL**  
**S3.1** 3/4" = 1'-0"



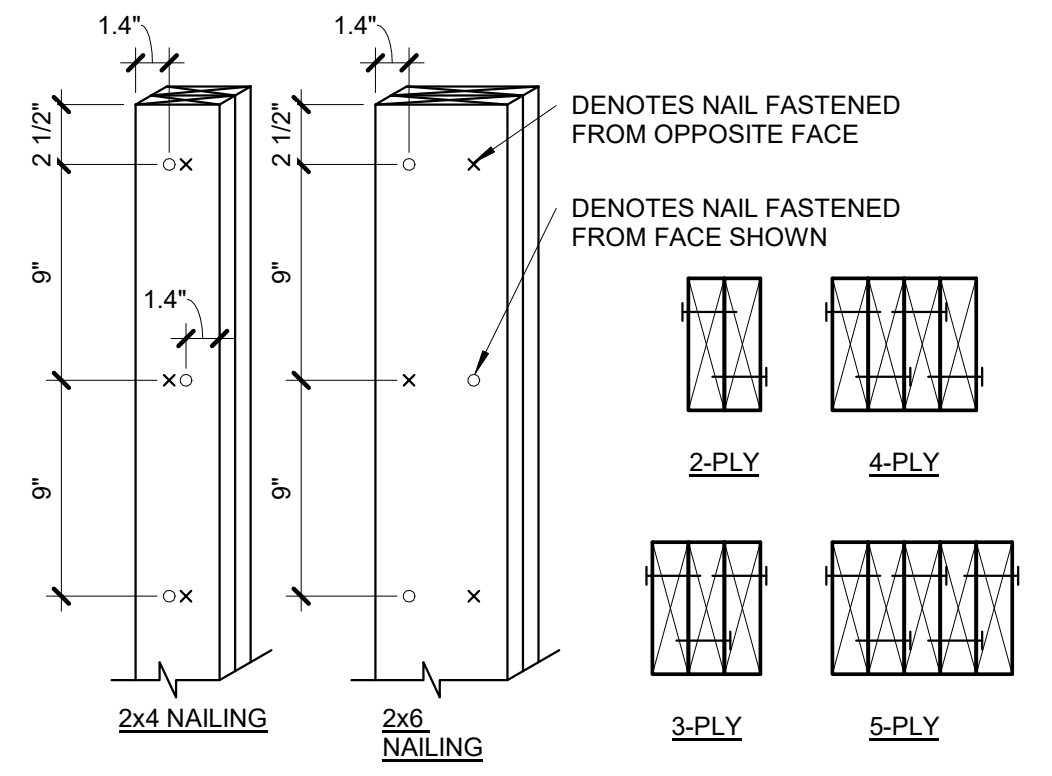
**3 BEAM TO GIRDER CONNECTION**  
**S3.1** 1 1/2" = 1'-0"

BEAM CONNECTION SCHEDULE		
BEAM SIZE	# OF BOLTS "N"	# OF BOLTS "M"
W8, W10	2	4
W12, W14	3	6
W16, W18	4	8

NOTES:  
1. THESE CONNECTIONS ARE TYPICAL, UNO.  
2. NUMBER OF BOLTS IN UPSET BEAM CONNECTIONS DETERMINED BY SMALLER OF TWO BEAMS AT CONNECTION.  
3. ALL AROUND 1/4" FILLET WELD MAY BE SUBSTITUTED FOR EITHER BOLTED CONNECTION.  
4. ALL BOLTS, 3/4" DIAMETER, A325-N, UNO.

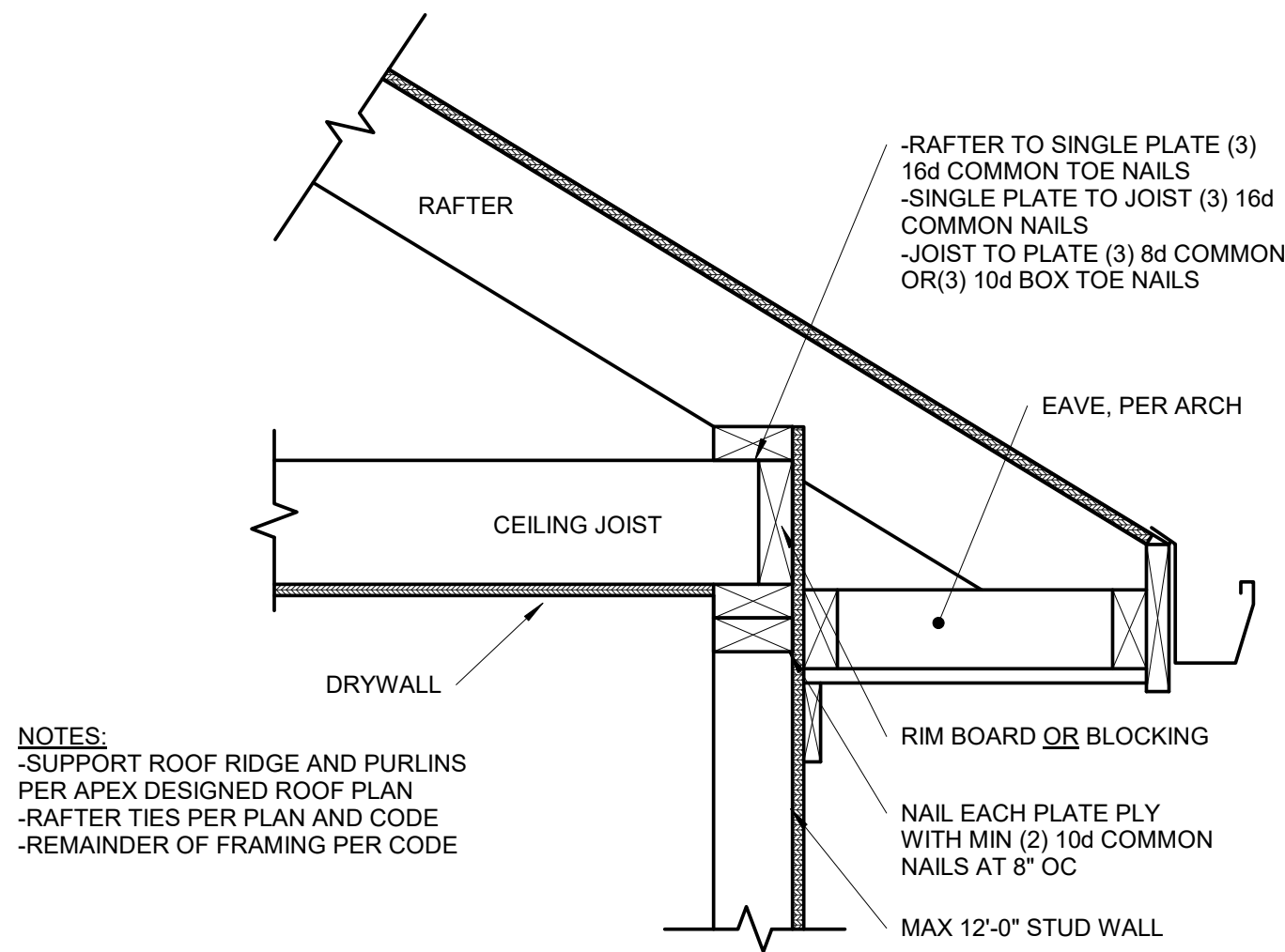


**2 BEAM SPLICE DETAIL**  
**S3.1** 1 1/2" = 1'-0"



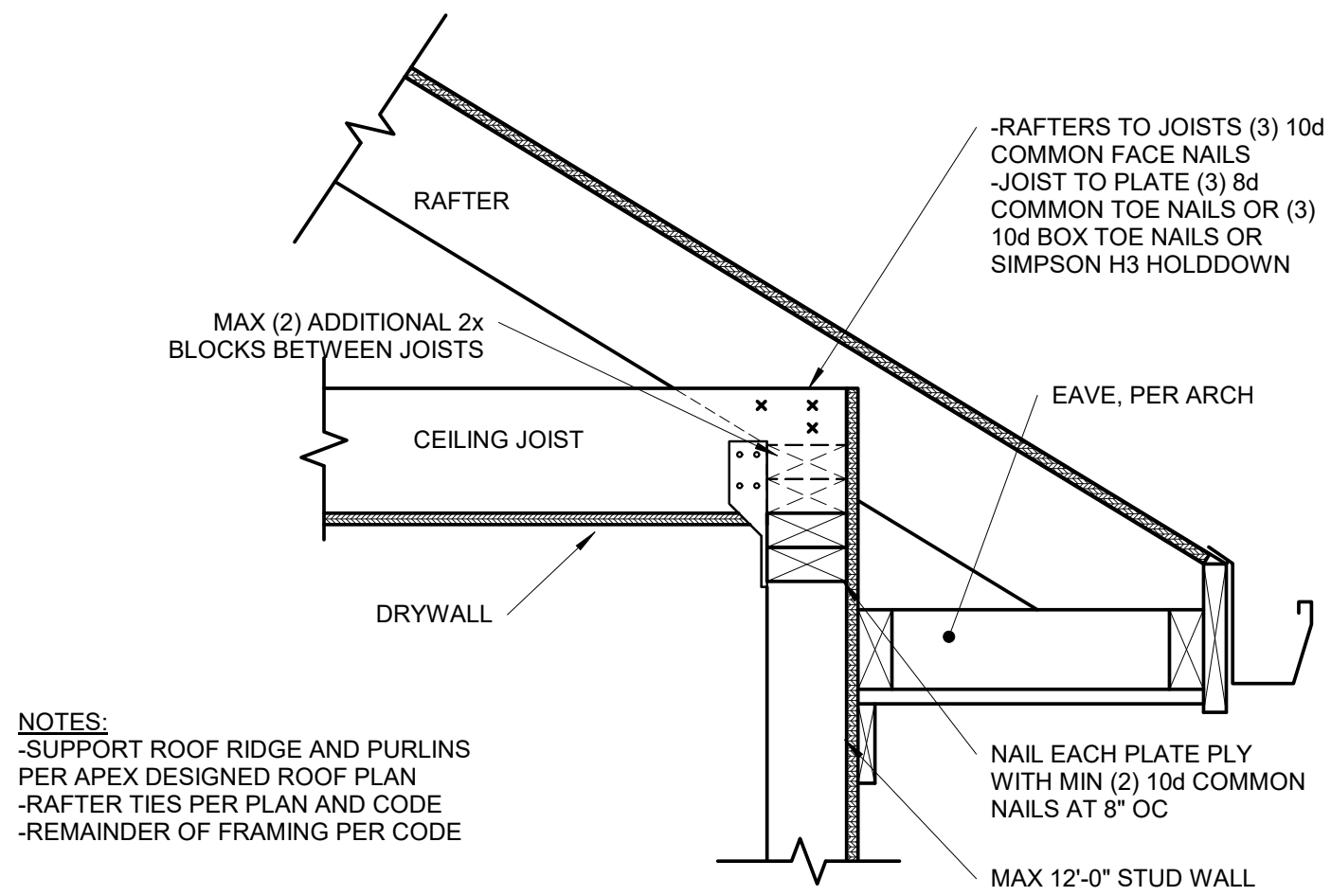
**1 BUILT-UP STUD COLUMN**  
**S3.1** 1 1/2" = 1'-0"





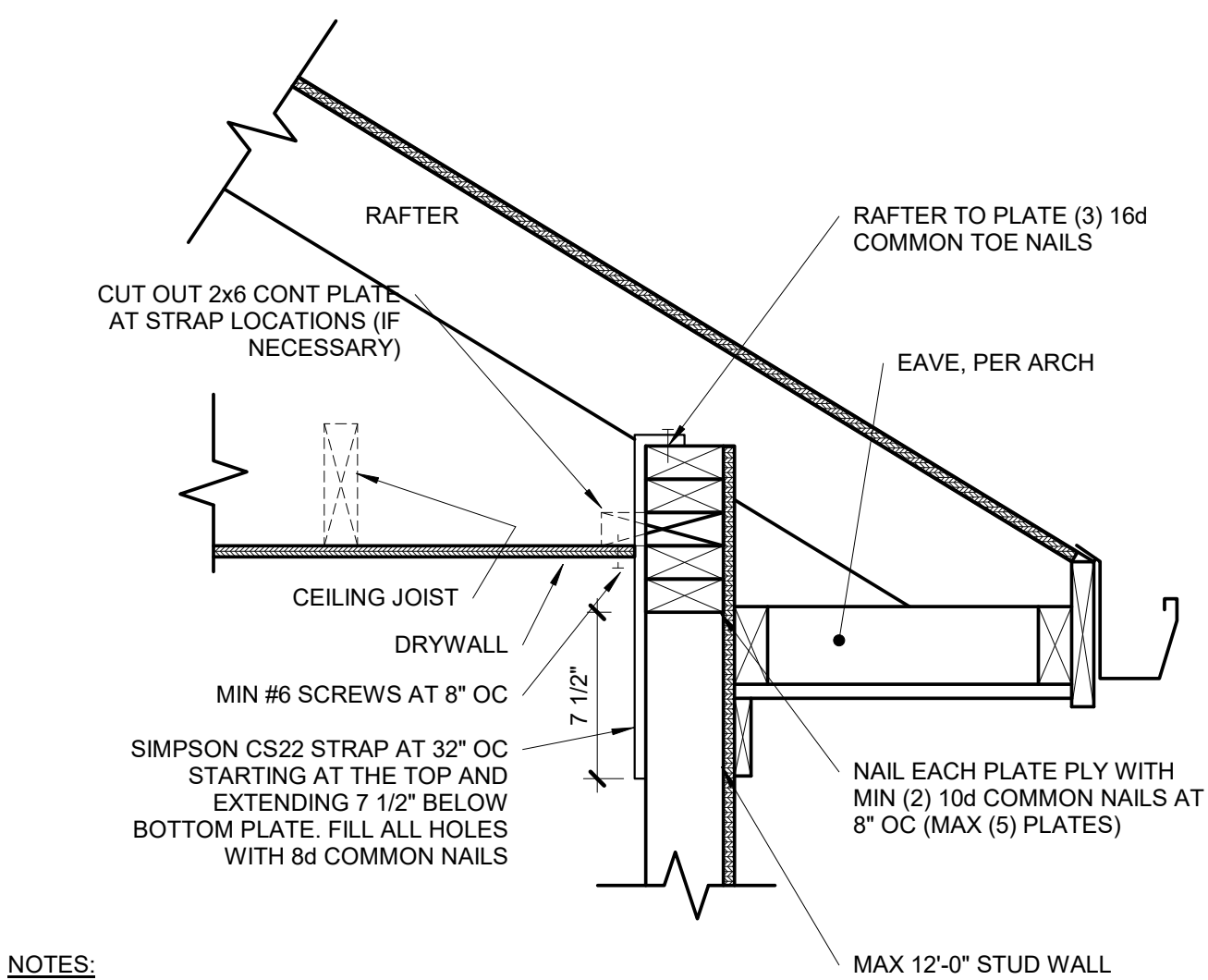
### 8 | OPTIONAL RAFTER BEARING

S3.2 1 1/2" = 1'-0"



### 7 | OPTIONAL RAFTER BEARING

S3.2 1 1/2" = 1'-0"

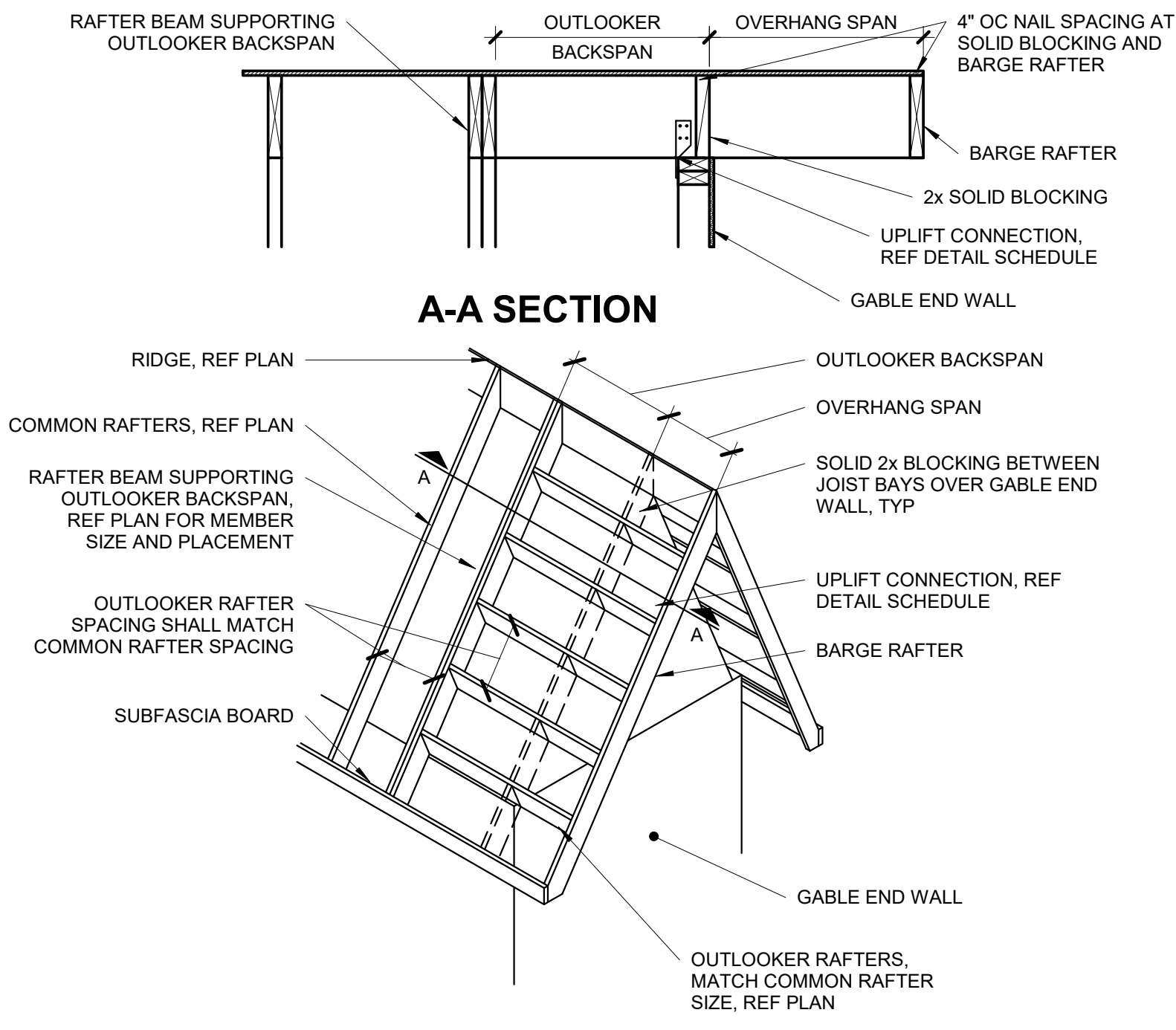


### 6 | OPTIONAL RAFTER BEARING

S3.2 1 1/2" = 1'-0"

### UPLIFT CONNECTION SCHEDULE

OVERHANG SPAN: 1'-1" TO 1'-9"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(1) AT 24" OC	(1) AT 24" OC
16" OC	SIMPSON H2.5A	(1) AT 32" OC	(1) AT 16" OC
24" OC	SIMPSON H2.5A	(1) AT 24" OC	(1) AT 24" OC
OVERHANG SPAN: 1'-10" TO 2'-6"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(1) AT 12" OC	(1) AT 12" OC
16" OC	SIMPSON H2.5A	(1) AT 16" OC	(2) AT 16" OC
24" OC	SIMPSON H2.5A	(2) AT 24" OC	(2) AT 24" OC
OVERHANG SPAN: 2'-7" TO 3'-9"			
RAFTER SPACING	UPLIFT CONNECTOR	EXPOSURE B	EXPOSURE C
12" OC	SIMPSON H2.5A	(2) AT 12" OC	(2) AT 12" OC
16" OC	SIMPSON H2.5A	(2) AT 16" OC	(2) AT 16" OC
24" OC	SIMPSON H2.5A	(2) AT 24" OC	N/A



### OUTLOOKER RAFTERS ROOF

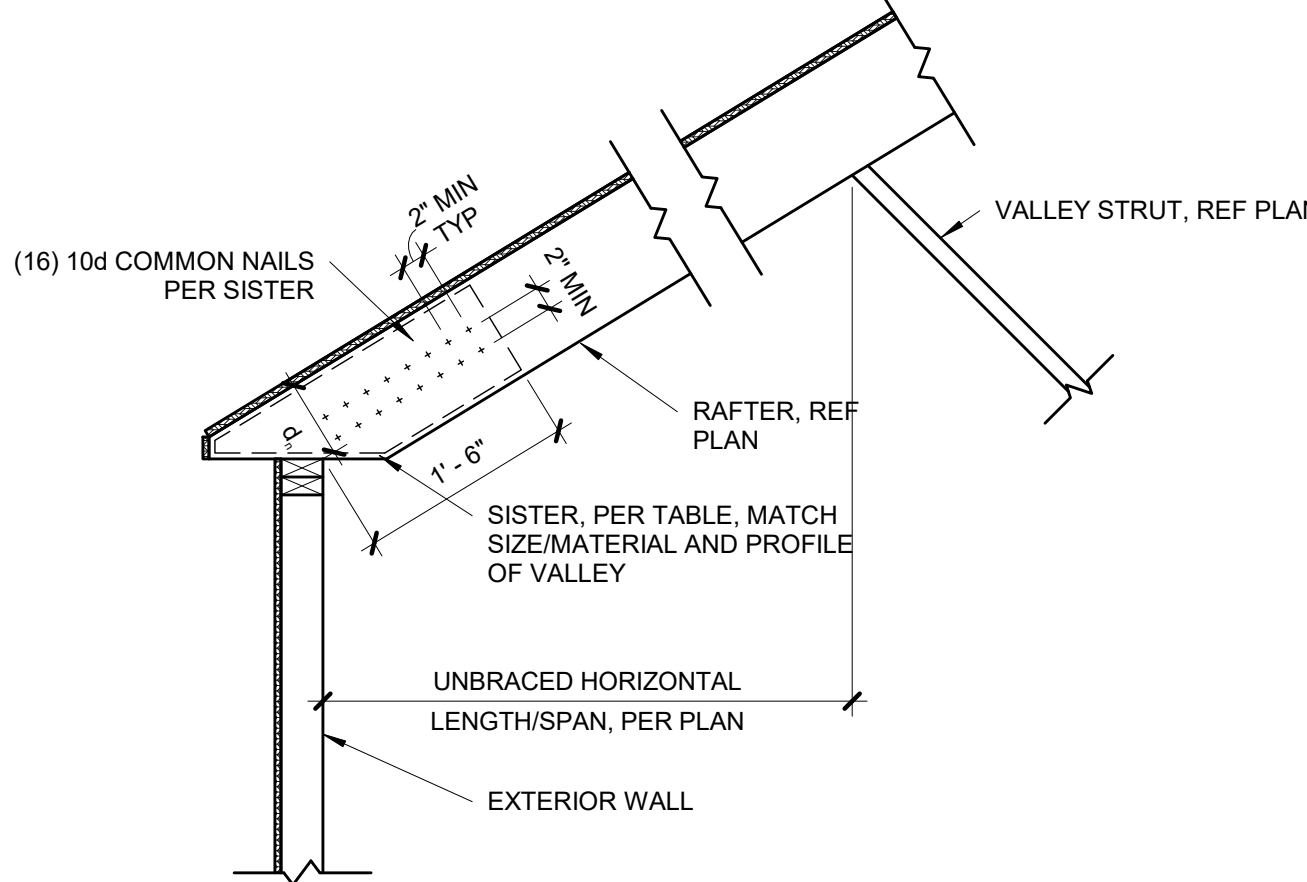
#### 5 | FRAMING

S3.2 NOT TO SCALE

### REQUIRED NUMBER OF SISTER PLIES

LIGHT ROOF									
2x VALLEY				LVL VALLEY					
# OF SISTER PLIES	RAFTER SIZE			# OF SISTER PLIES	RAFTER SIZE				
	2x6	2x8	2x10		2x6	2x8	2x10		
	0	4'-8"	6'-2"		7'-11"	0	8'-8"	11'-5"	14'-7"
	1	9'-5"	*		*	1	*	*	*
	2	*	N/A		N/A	2	N/A	N/A	N/A
HEAVY ROOF									
2x VALLEY				LVL VALLEY					
# OF SISTER PLIES	RAFTER SIZE			# OF SISTER PLIES	RAFTER SIZE				
	2x6	2x8	2x10		2x6	2x8	2x10		
	0	3'-6"	4'-7"		5'-11"	0	6'-6"	8'-7"	10'-11"
	1	7'-1"	9'-3"		*	1	13'-1"	*	*
	2	*	*		N/A	2	*	N/A	N/A

- \*VALLEYS OF A LENGTH GREATER THAN THAT FOUND IN THE CELL ABOVE ARE CONTROLLED BY BENDING. APPLY THE NUMBER OF SISTER PLIES CORRESPONDING TO THIS ROW.
- THIS TABLE IS INTENDED TO BE USED IN CONJUNCTION WITH THE STAMPED, ENGINEERED PLANS AS THEY ARE DRAWN BY APEX. BRACING LOCATIONS SHALL DETERMINE HORIZONTAL UNSUPPORTED SPAN FROM VALLEY BEARING AND BE USED TO DETERMINE THE NUMBER OF SISTERS REQUIRED. BRACING LOCATIONS ARE **NOT** TO BE INFERRED USING THIS TABLE.
  - TABLE VALUES ARE BASED ON A DEPTH OF MEMBER REMAINING, d, EQUAL TO THE DEPTH OF THE RAFTERS. IF d IS OBSERVED TO BE LESS THAN THE DEPTH OF THE RAFTER, THE VALLEY WILL NEED TO BE EITHER REPLACED OR ANALYZED BY APEX. TABLE VALUES ARE VALID FOR TAPERED CUTS ONLY, REF DETAIL 4/53.2.
  - IF MULTI-PLY VALLEY IS SPECIFIED ON PLAN TREAT EACH ADDITIONAL PLY AS A SISTER PLY WHEN LOOKING UP MAX SPAN.
  - MAX 14'-0" HORIZONTAL RAFTER SPAN IN BOTH DIRECTIONS FROM VALLEY.
  - ALL HIPs ARE DESIGNED TO BE CONTROLLED BY BENDING. SHEAR AT BEARING WITH MIN 5 1/2" DEPTH DOES NOT CONTROL DESIGN.

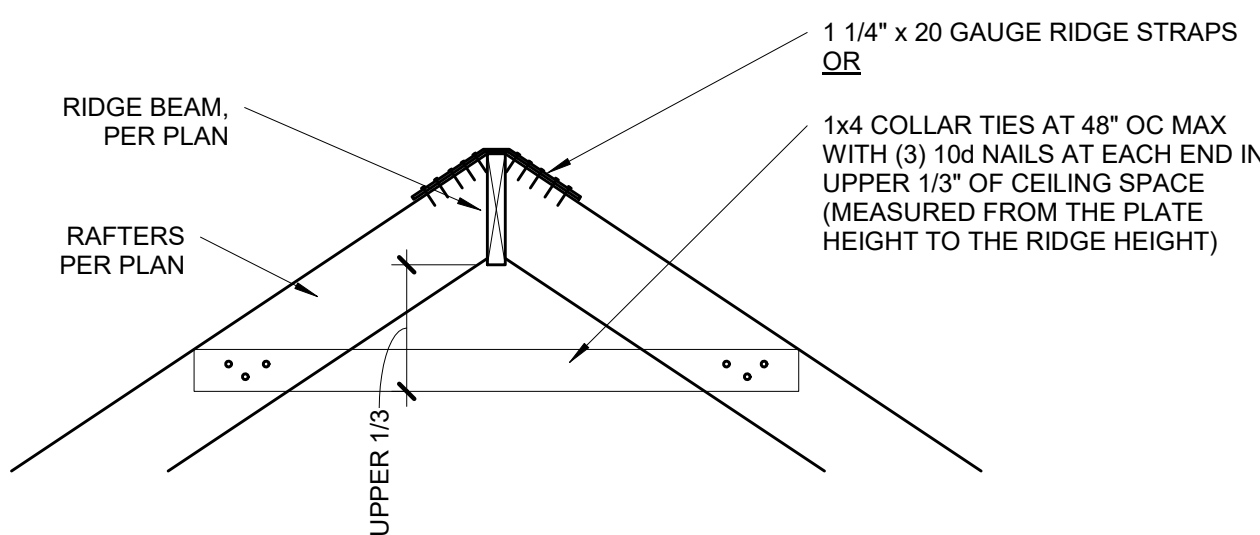


### 4 | TAPERED VALLEY

S3.2 3/4" = 1'-0"

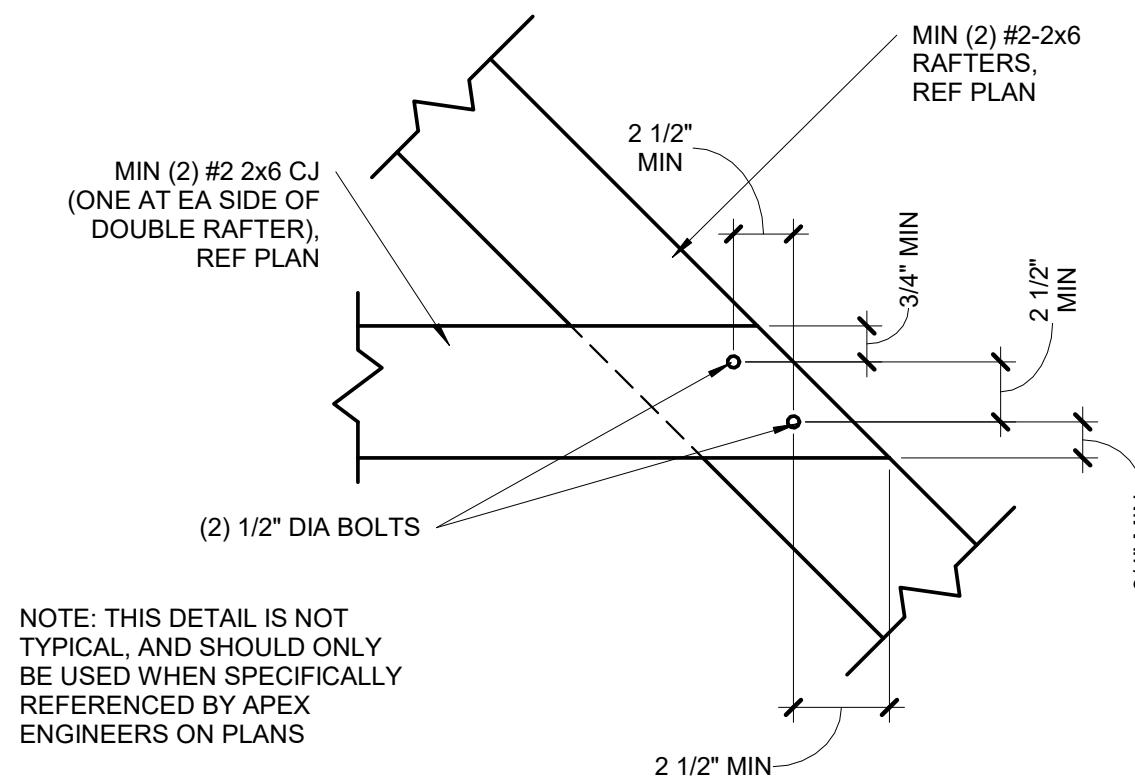
OVERHANG SPAN	MIN BACKSPAN LENGTH
≤1'-0"	1'-0"
1'-1" to 2'-0"	EQUALS OVERHANG SPAN
≥2'-1"	OVERHANG SPAN x2

NOTES:  
-CHART IS ONLY APPLICABLE IF NO RAFTER BEAM SHOWN ON PLAN.  
-CONTACT EOR IF OVERHANG LENGTH EXCEEDS CHART OPTIONS.



### 3 | RIDGE BEAM DETAIL

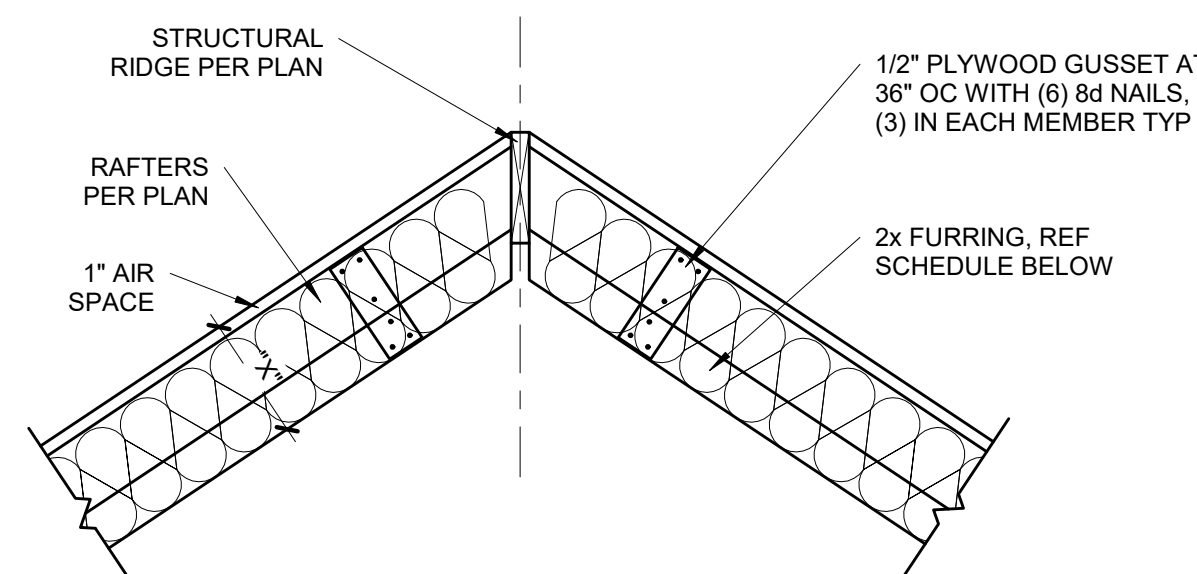
S3.2 3/4" = 1'-0"



NOTE: THIS DETAIL IS NOT TYPICAL, AND SHOULD ONLY BE USED WHEN SPECIFICALLY REFERENCED BY APEX ENGINEERS ON PLANS

### 2 | BOLTED RAFTER HIP CONNECTION

S3.2 1 1/2" = 1'-0"



### FURR OUT SCHEDULE

RAFTER SIZE	R-30C INSULATION (X= 9 1/4")	R-38C INSULATION (X=11 1/4")
2x6	2x6	2x8
2x8	2x4	2x6
2x10	NOT REQUIRED	2x4
2x12	NOT REQUIRED	REQUIRED

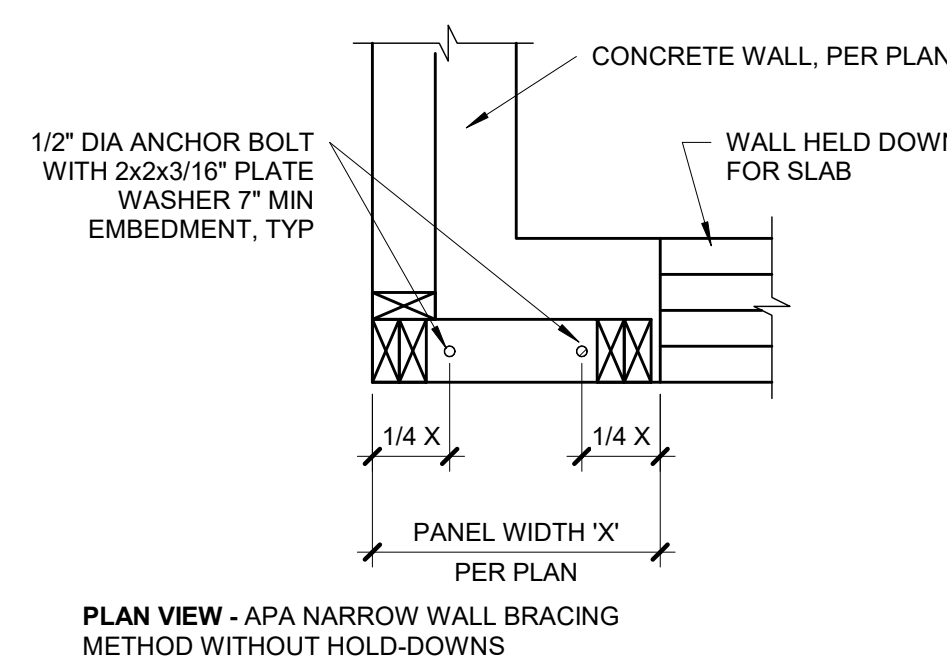
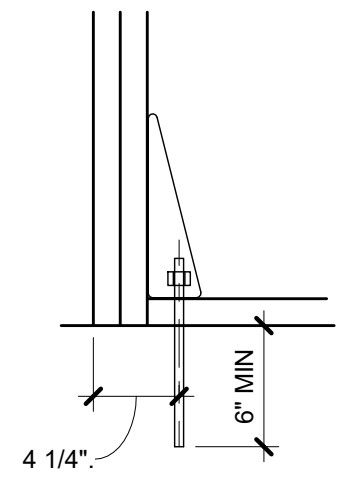
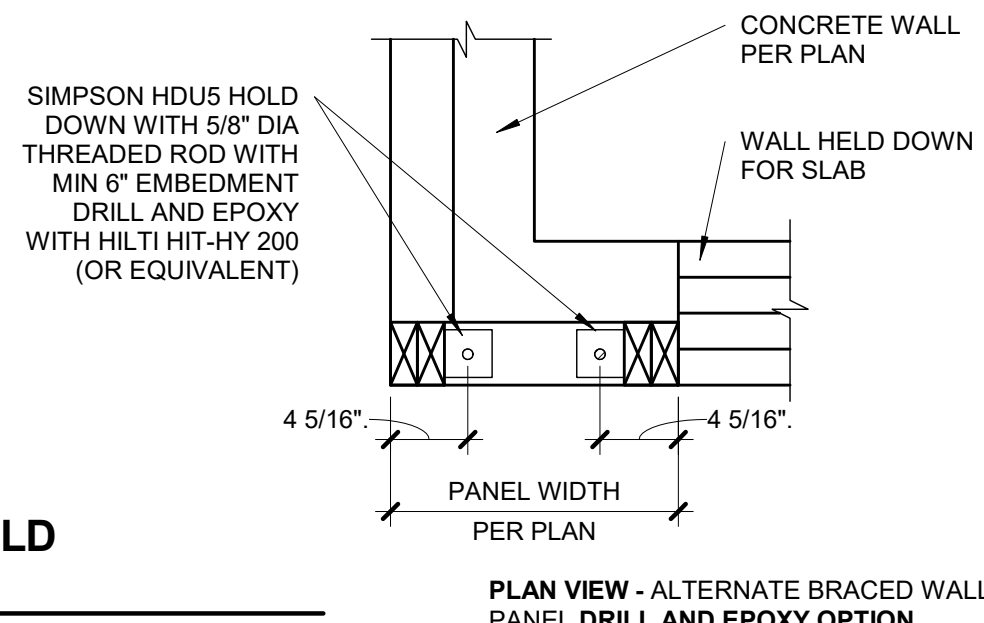
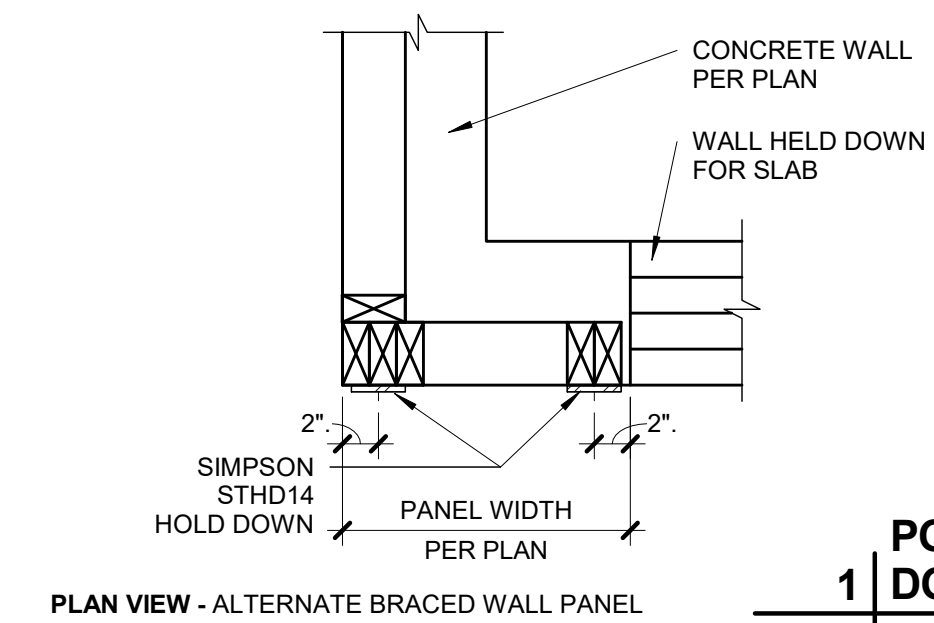
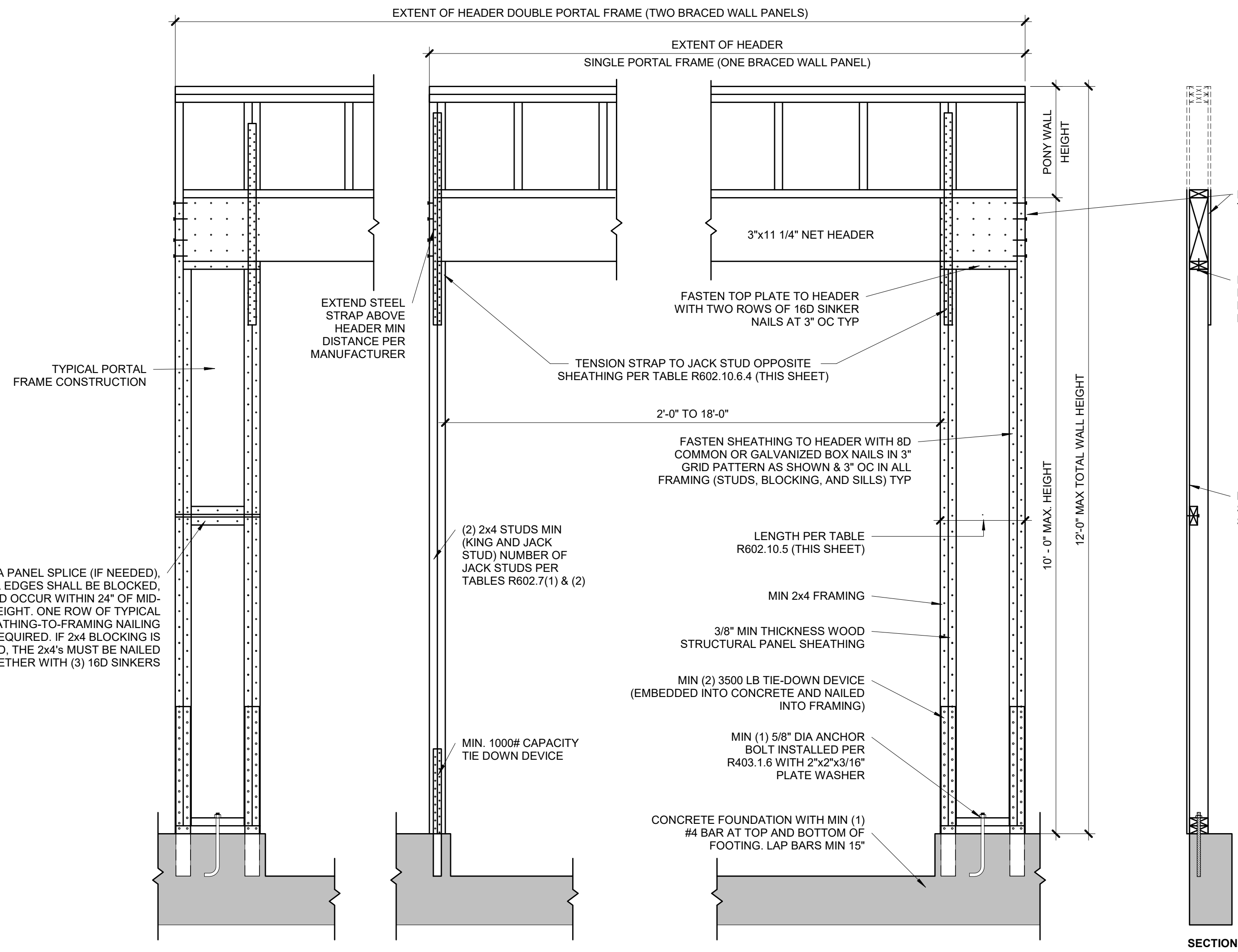
NOTES:  
1. ALL VAULTED RAFTERS SHALL BE #2-2x6 DF-L, MINIMUM, AT 16" OC, PER SPAN CHART, UNLESS NOTED OTHERWISE.  
2. ALL VAULTS SHALL BE FURRED DOWN WITH 2x FRAMING TO THE REQUIRED DEPTH OF INSULATION, PLUS 1" AIR SPACE.  
3. R-30C INSULATION = 8 1/4" THICK  
4. R-38C INSULATION = 10 1/4" THICK  
5. INSULATION REQUIREMENTS MAY BE REDUCED TO R30 IF ROOF/CEILING ASSEMBLY DOES NOT ALLOW SUFFICIENT SPACE BUT IS LIMITED TO VAULTED CEILING AREAS THAT ARE LESS THAN 500 SQUARE FEET OR 20 PERCENT OF THE TOTAL INSULATED CEILING AREA, WHICHEVER IS LESS. (PER N1102.2.2)

### VAULTED RAFTER INSULATION

#### 1 | FURR OUT

S3.2 3/4" = 1'-0"





**PORTAL FRAME AT GARAGE DOOR WITHOUT HOLD DOWNS (METHOD PFG)**

**1**  
**S4.0**  
ALT 3/4" = 1'-0" (ALT ALLOWED AT GARAGE DOOR ONLY) (PER IRC R602.10.6.3)

**TABLE R602.10.5 (PARTIAL)**

METHOD	MINIMUM LENGTH OF BRACED WALL PANELS					
	MIN LENGTH (INCHES)					
	8 FEET	9 FEET	10 FEET	11 FEET	12 FEET	
1. SUPPORTING ROOF ONLY	16	16	16	16	16	
2. ONE STORY AND ROOF	24	24	24	24	24	
PFG	24	27	30	30	30	

NOTE: MAX HEADER HEIGHT IS 10'-0", BUT WALL HEIGHT SHALL BE PERMITTED TO BE INCREASED TO 12'-0" WITH PONY WALL

TABLE R602.10.6.4				
TENSION CAPACITY STRAP TABLE				
MIN WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAX PONY WALL HEIGHT (FEET)	MAX TOTAL WALL HEIGHT (FEET)	MAX OPENING WIDTH (FEET)	TENSION STRAP CAPACITY REQ (LBS) 115 MPH, EXP B
2x4 #2 GRADE	0	10	18	1,000
	1	10	9	1,000
			16	1,025
			18	1,275
	2	10	9	1,000
			16	2,175
			18	2,500
	2	12	9	1,500
			16	3,375
			18	3,975
4	12	9	2,750	
		16	3,775	
		18	4,000	
2x6 STUD GRADE	2	12	9	1,000
			16	2,150
			18	2,550
	4	12	9	1,750
			16	2,400
			18	3,800

**BRACED WALL METHODOLOGY**  
CONTINUOUS EXTERIOR SHEATHING (CS-WSP) PER WSP METHOD (BELOW) UNLESS OTHERWISE NOTED ON THE PLAN

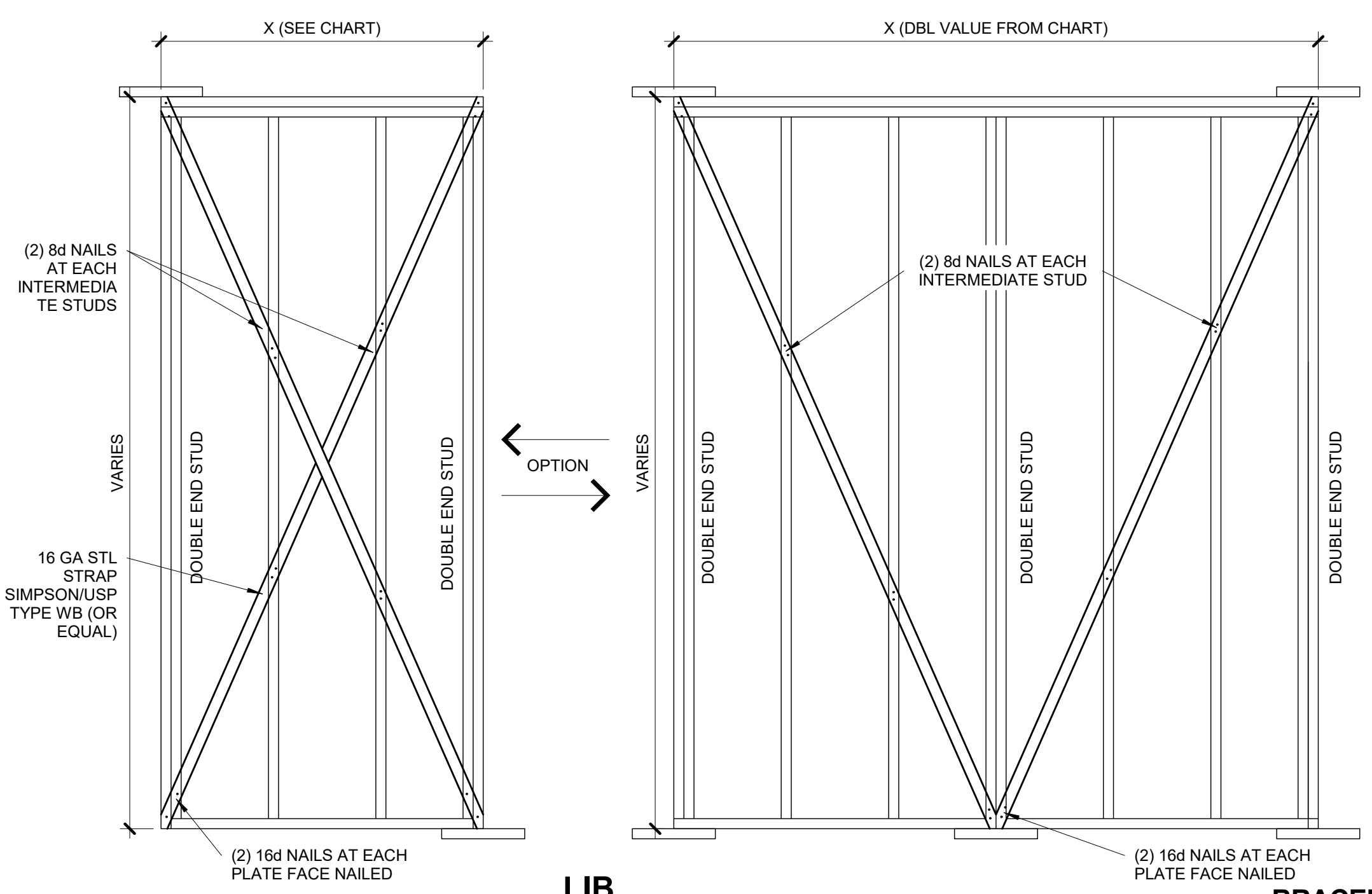
**XXXX EXTERIOR BRACED WALLS:**  
WSP METHOD:  
WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN 3/8" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 24/16 FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.  
(NOTE: FRAMING MEMBERS 16" OC MAX UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

**///// INTERIOR BRACED WALLS (REF 2/S4.0):**  
GB METHOD:  
1/2" MIN GYPSUM BOARD OVER STUDS SPACED 24" MAX FASTENED WITH #6 - 1 1/4" TYPE "W" OR "S" DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES.)  
OR  
LIB METHOD:  
1/4" WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA TYPE WB (OR EQUAL) STL X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" OC STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

**BRACED WALL PANEL SCHEDULE**

WALL HEIGHT	MIN WALL LENGTH (X)	MAX WALL LENGTH (X)
8'-0"	4'-7"	8'-0"
9'-0"	5'-2"	9'-0"
10'-0"	5'-9"	10'-0"
11'-0"	NP	-
12'-0"	NP	-

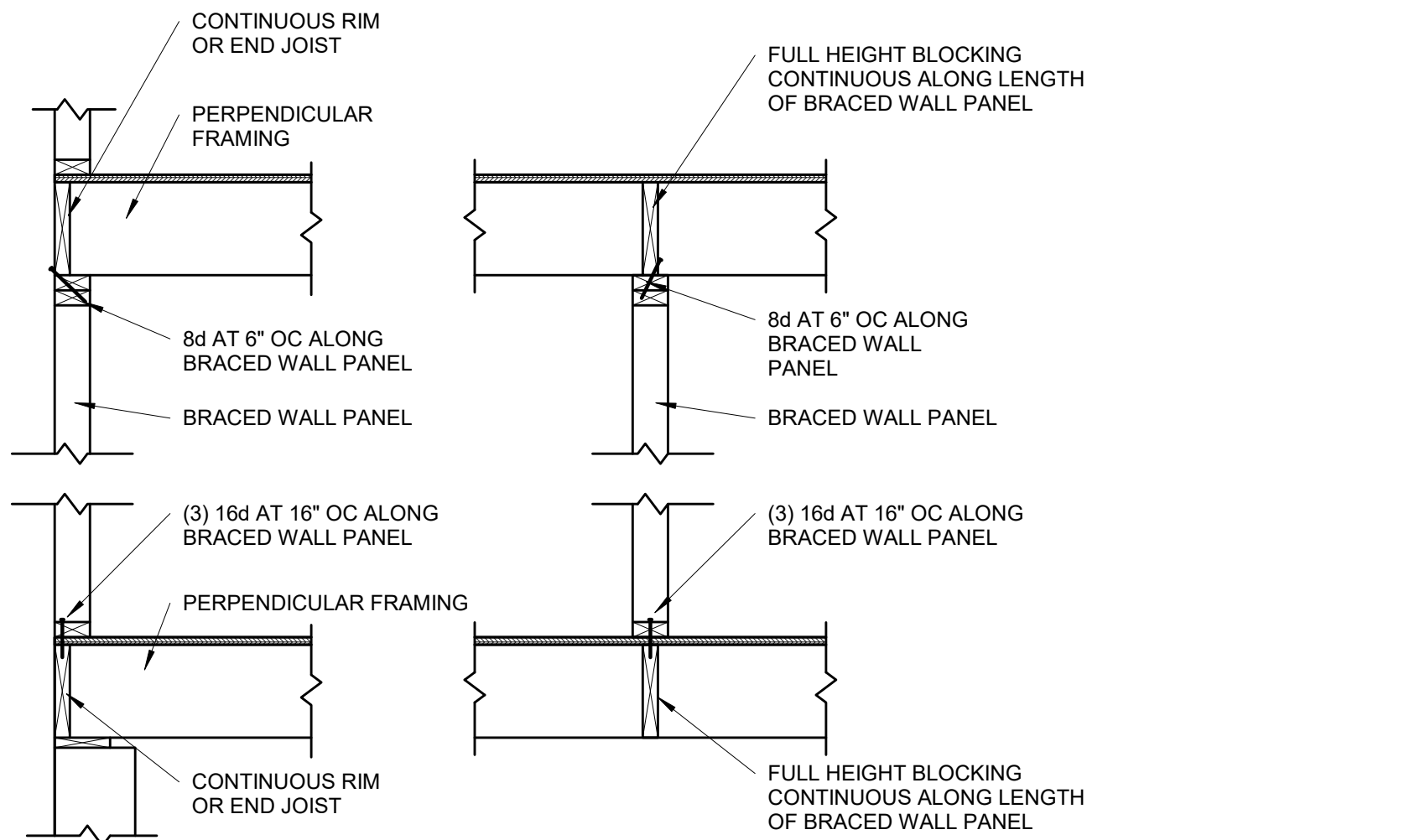
NOTE: BRACED WALL PANEL LENGTHS BASED ON WALL HEIGHT FOR IRC, LIB



**BRACED WALL PANEL-IRC**  
**2**  
**METHODS LIB AND GB**

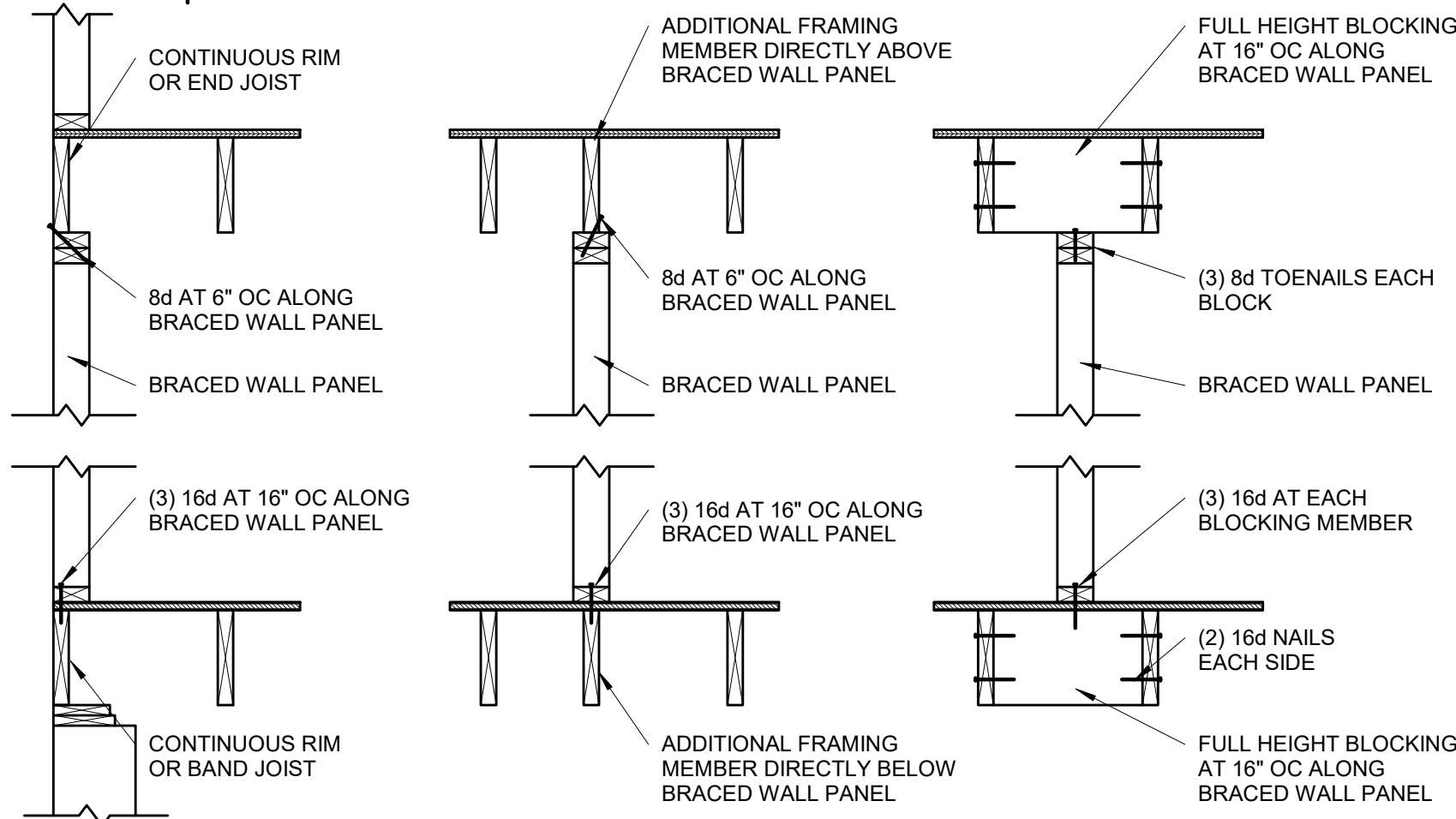
**S4.0**  
3/4" = 1'-0"





**BRACED WALL PANEL  
CONNECTION WHEN  
PERPENDICULAR TO  
FLOOR/CEILING FRAMING**

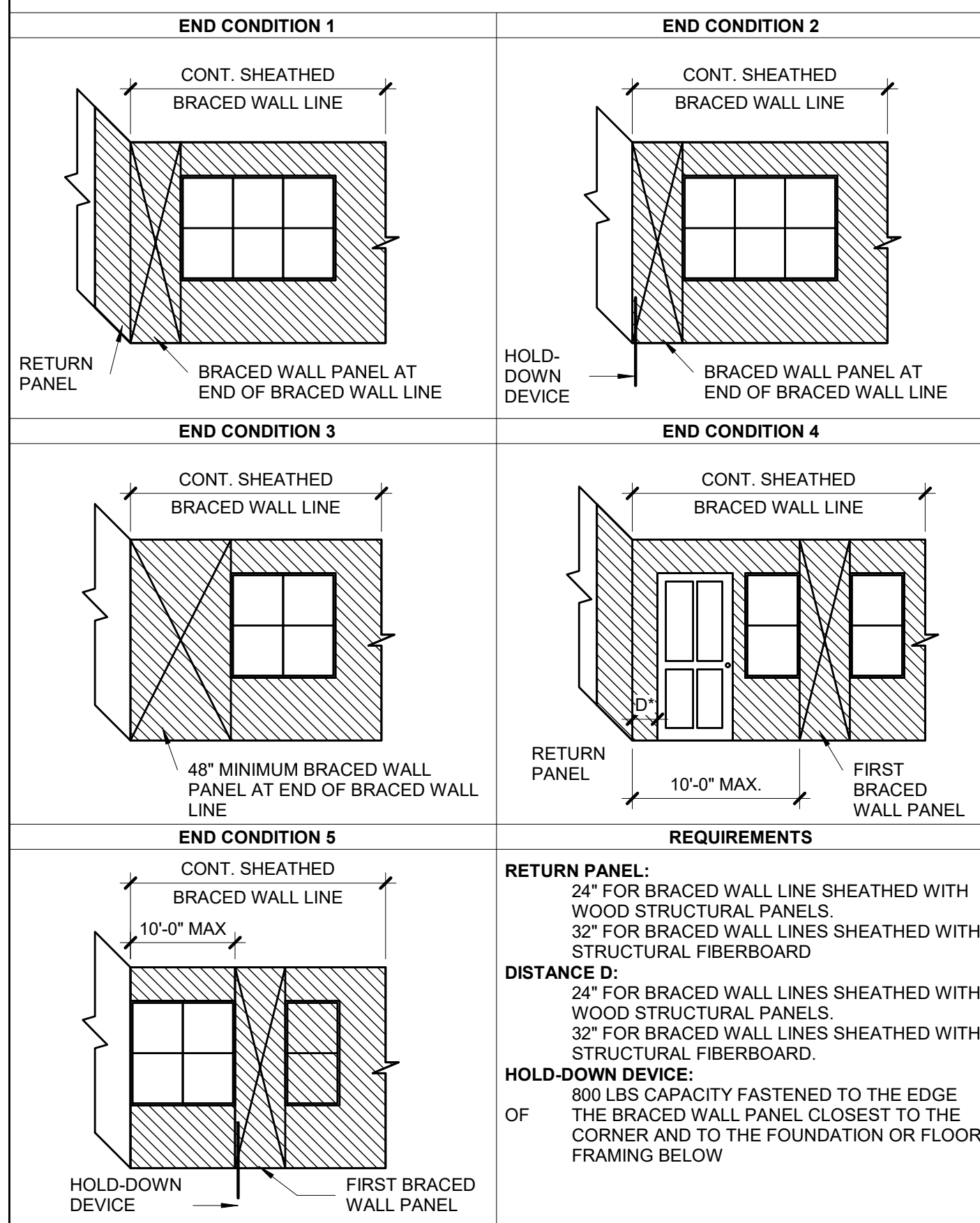
**S4.1** 3/4\"/>



**BRACED WALL PANEL  
CONNECTION WHEN PARALLEL  
TO FLOOR/CEILING FRAMING**

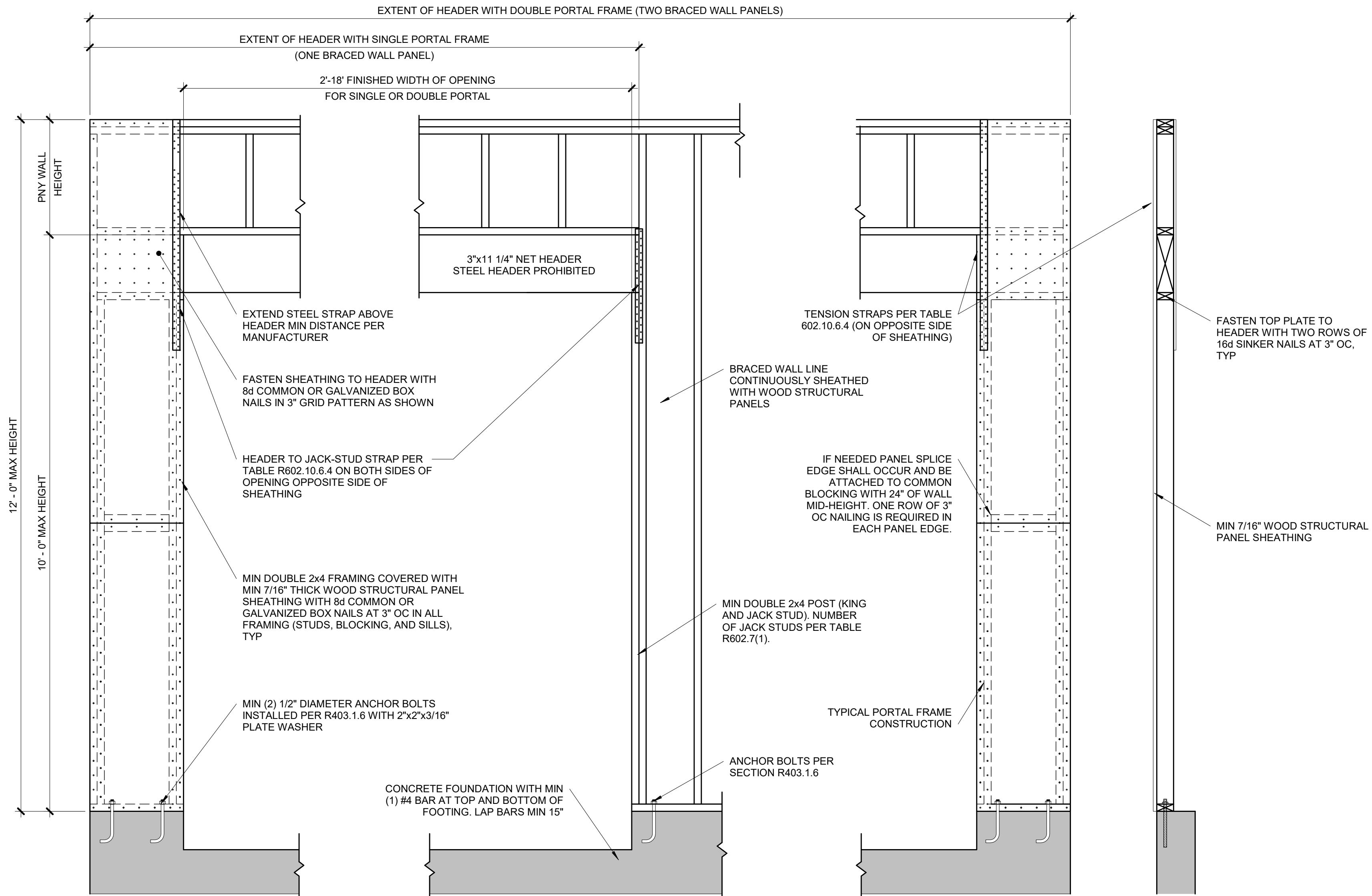
**S4.1** 3/4\"/>

**CONT. SHEATHED BRACED WALL END CONDITIONS**

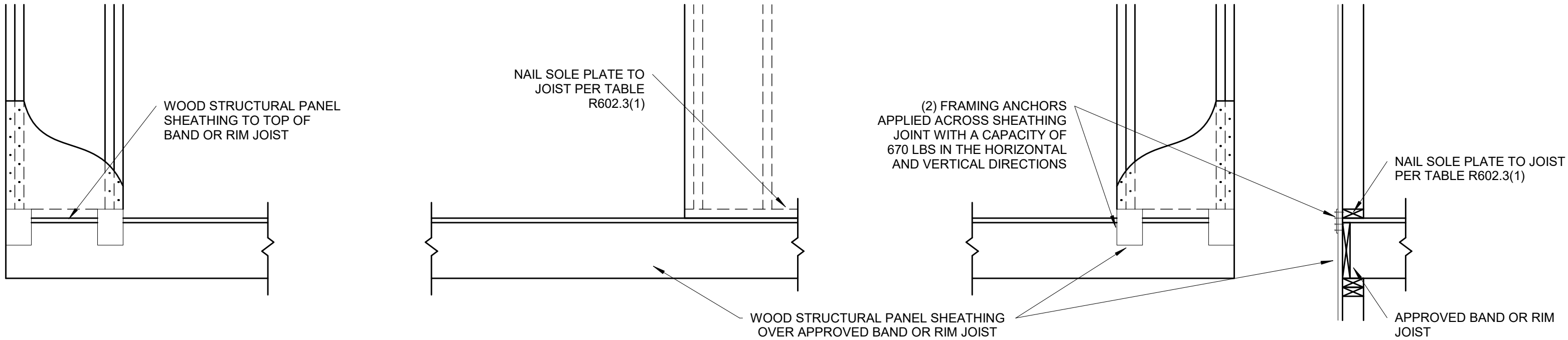


**CONTINUOUS SHEATHED BRACED  
WALL END CONDITIONS**

**S4.1** NOT TO SCALE (COMPLIANCE WITH IRC R602.10.7)

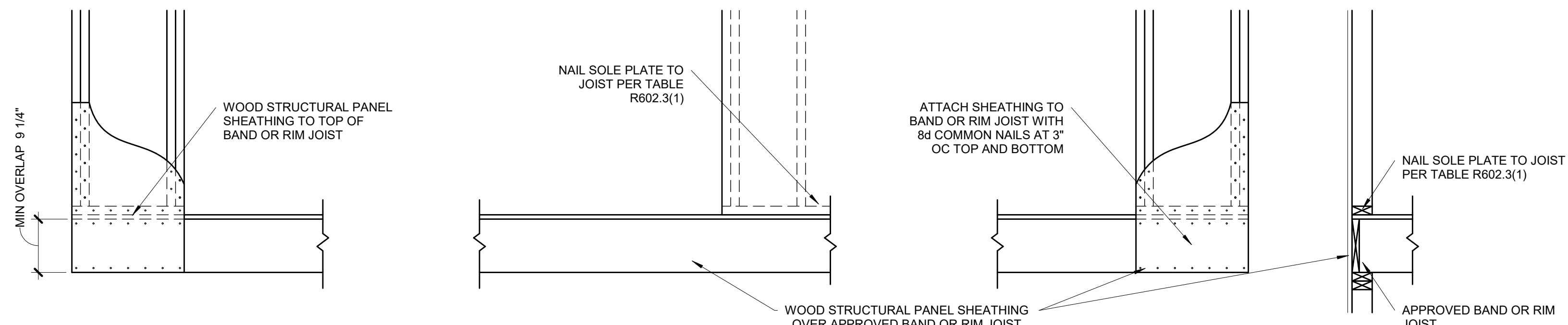


**OVER CONCRETE OR MASONRY BLOCK FOUNDATION**



**OVER RAISE WOOD FLOOR - FRAMING ANCHOR OPTION**

(WHEN PORTAL SHEATHING DOES NOT LAP OVER BAND OR RIM JOIST)



**OVER RAISE WOOD FLOOR - OVERLAP OPTION**

(WHEN PORTAL SHEATHING LAPS OVER BAND OR RIMBOARD)

**BRACED WALL PANEL-IRC  
METHOD CS-PF CONTINUOUSLY  
SHEATHED PORTAL FRAME  
PANEL CONSTRUCTION**

**S4.1** 3/4\"/>

(PER IRC R602.10.6.4)